Fig. 1

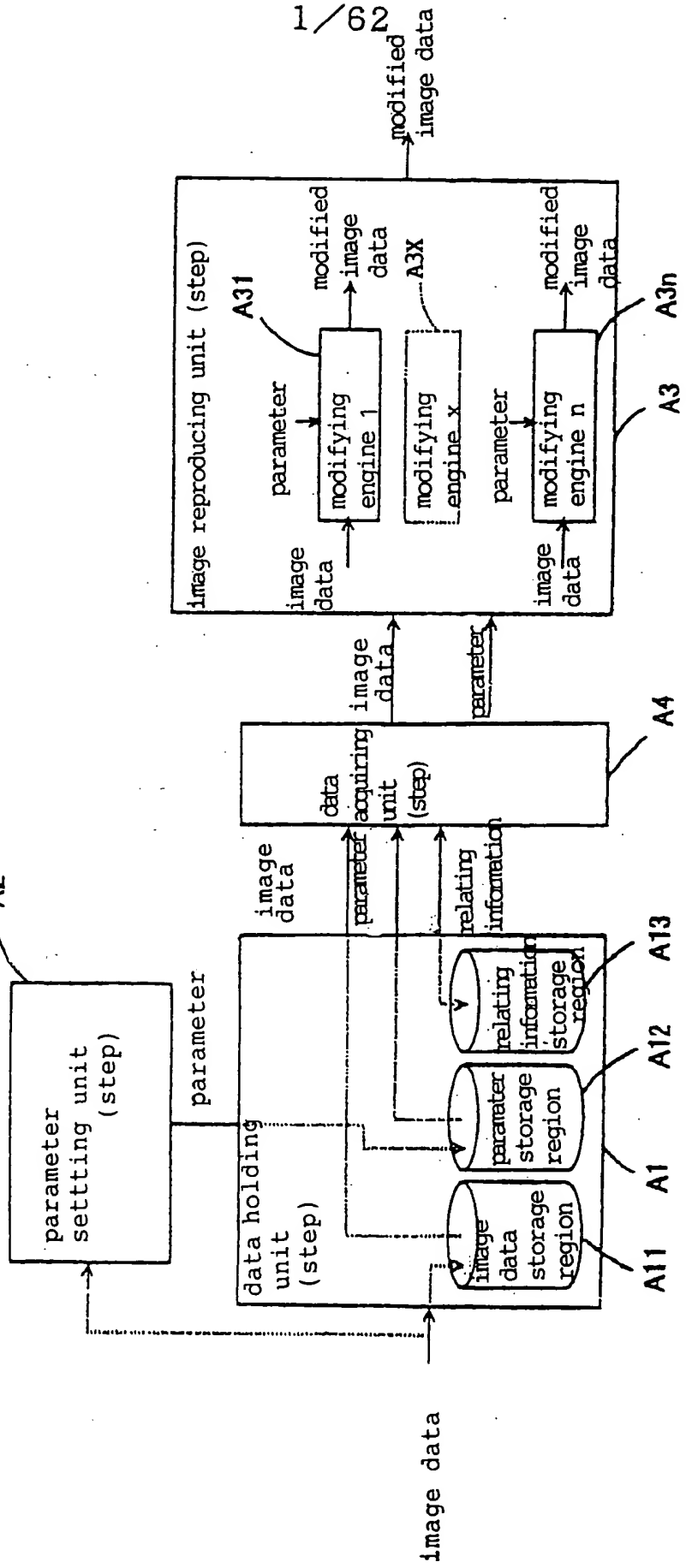

modified image data
image reproducing unit (step)
A31
modified image data
A3X
modified image data
A3n
parameter
modifying engine 1
modifying engine x
parameter
modifying engine n
A3
image data
image data
image data
parameter
A4
data acquiring unit (step)
image data
parameter
relating information
A2
parameter setting unit (step)
parameter
data holding unit (step)
relating information storage region
A13
parameter storage region
A12
image data storage region
A11
A1
image data

Fig. 2

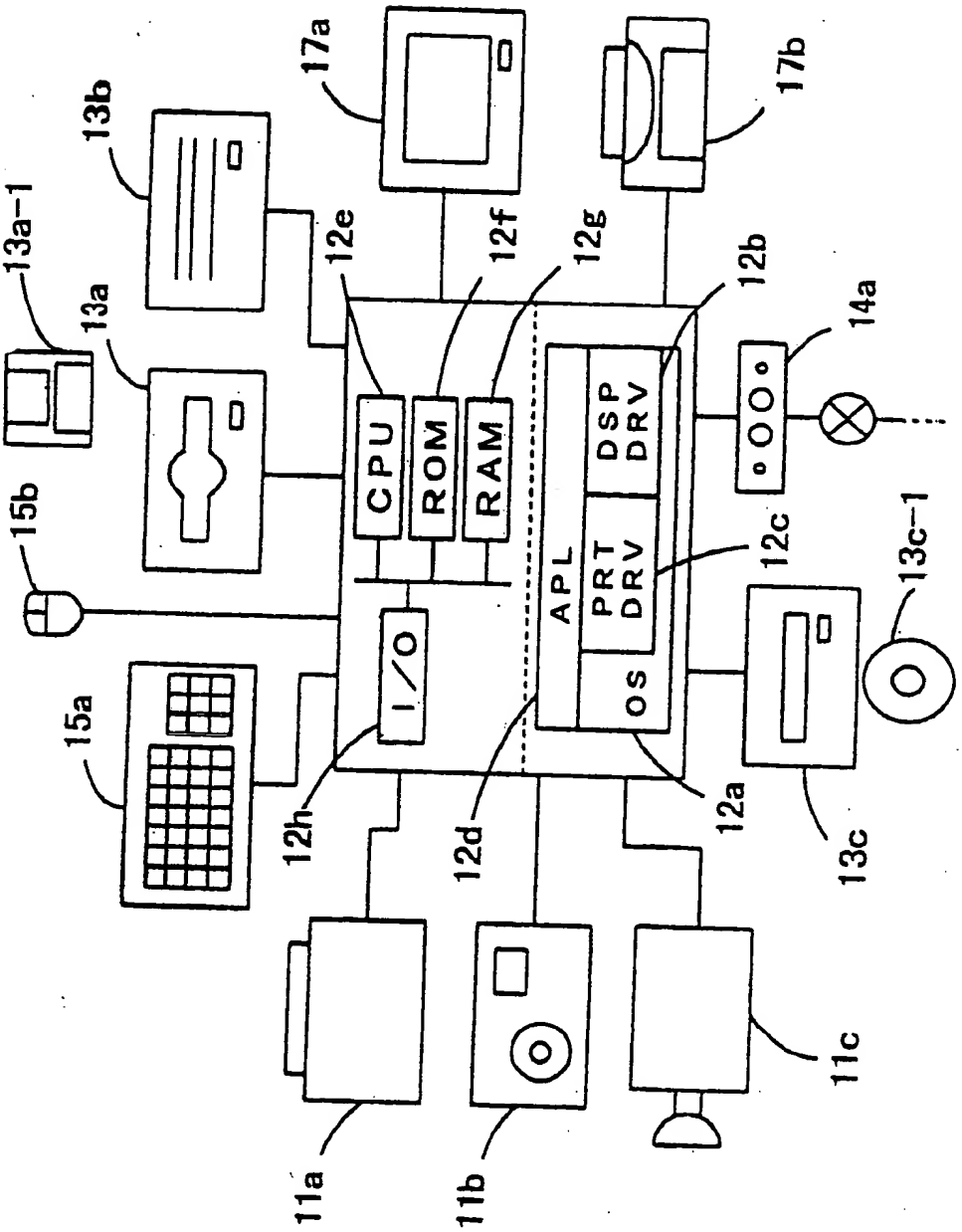
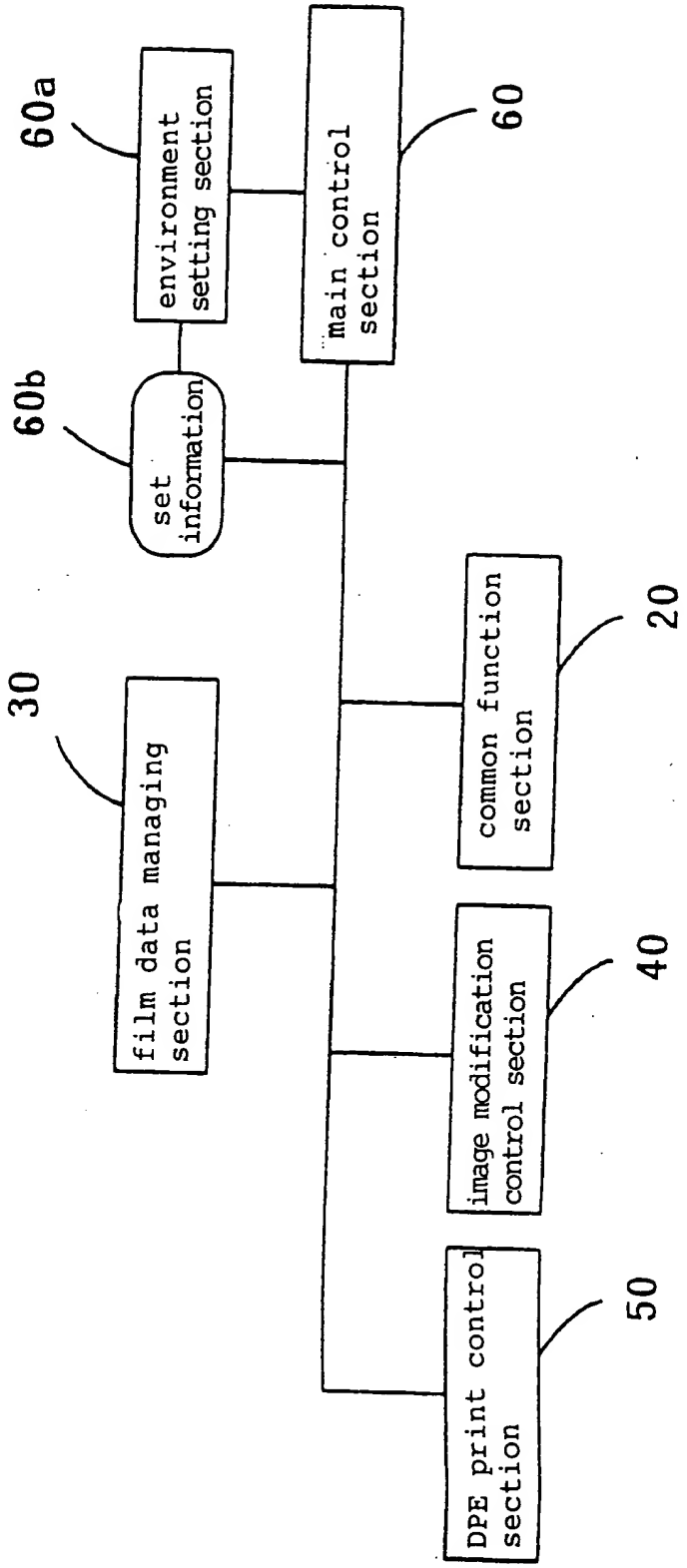

17a
17b
13b
13a-1
13a
12e
12f
12g
12b
14a
CPU
ROM
RAM
APL
PRT DRV
DSP DRV
OS
15b
12c
13c-1
I/O
15a
12h
12d
12a
13c
11c
11a
11b

Fig. 3



0000590 "596256A0

Fig. 4

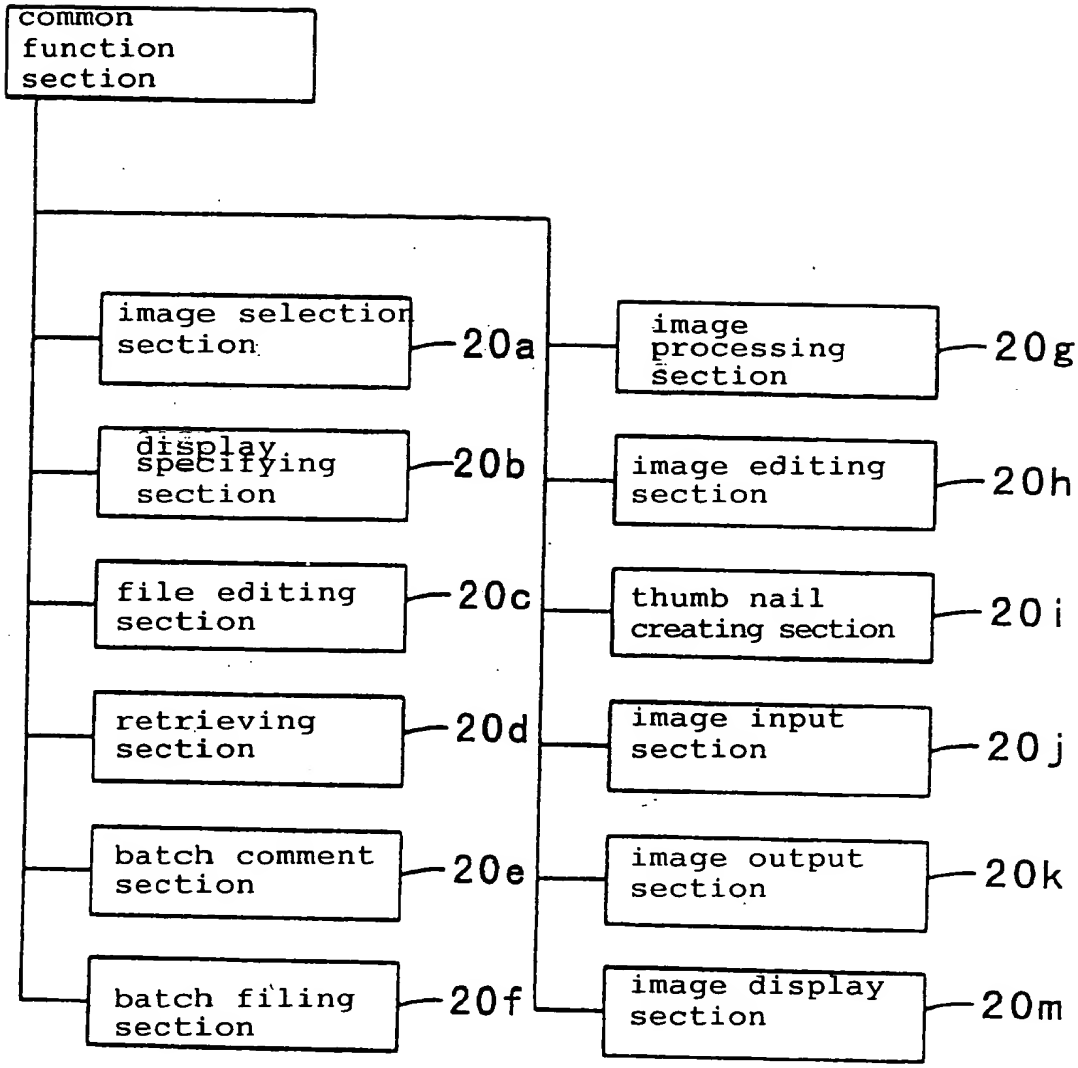
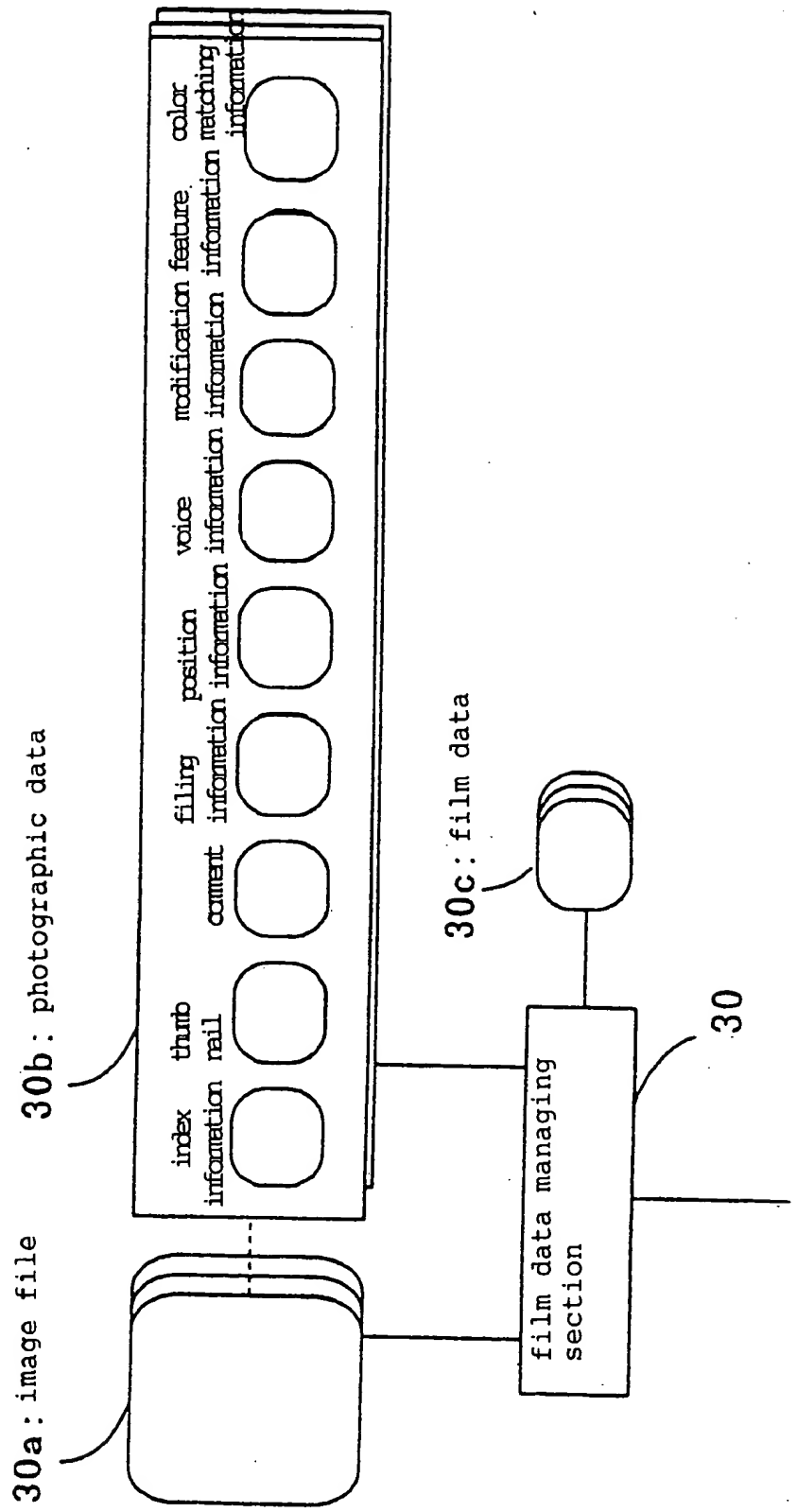

common function section
image selection section
20a
display specifying section
20b
file editing section
20c
retrieving section
20d
batch comment section
20e
batch filing section
20f
image processing section
20g
image editing section
20h
thumb nail creating section
20i
image input section
20j
image output section
20k
image display section
20m

Fig. 5



DOCID: "09529665"

Fig. 6

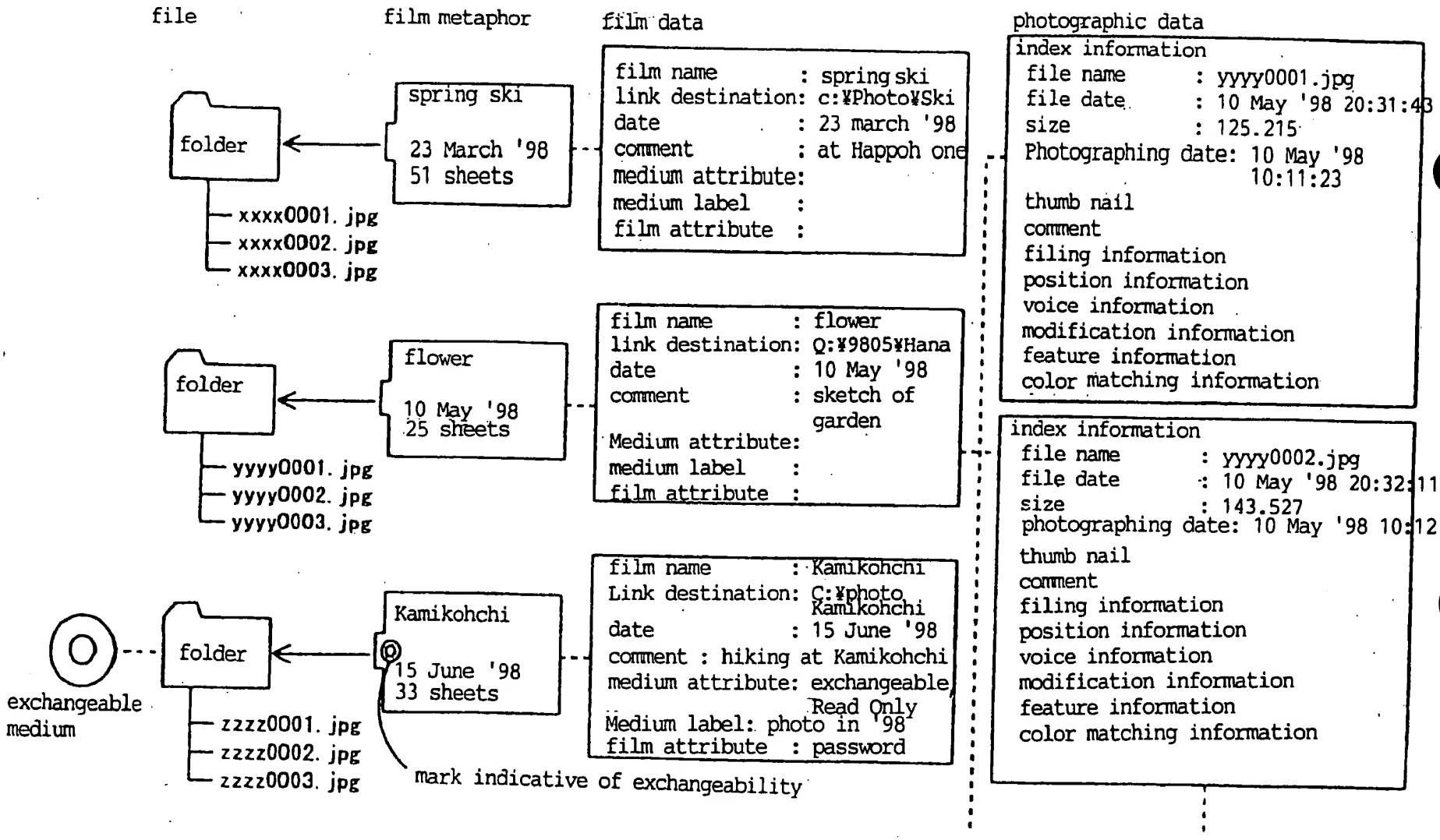
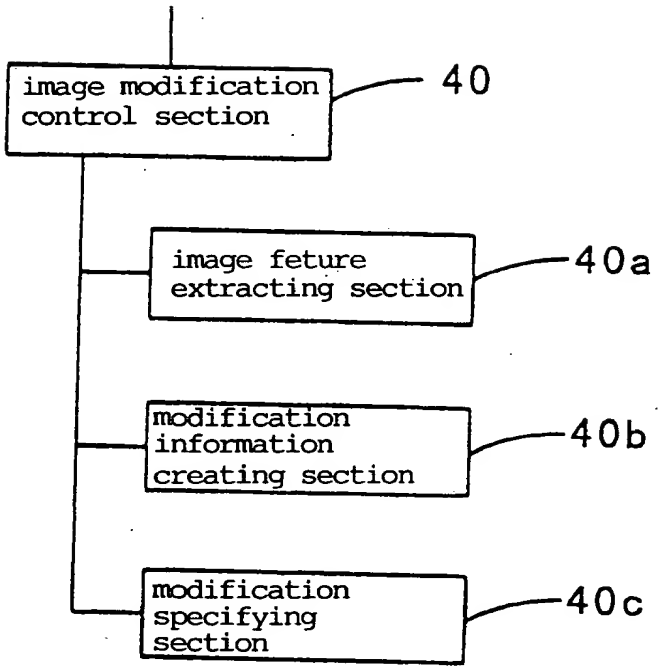

file
film metaphor
film data
photographic data
folder
spring ski
23 March '98
51 sheets
xxxx0001. jpg
xxxx0002. jpg
xxxx0003. jpg
film name : spring ski
link destination: c:¥Photo¥Ski
date : 23 march '98
comment : at Happoh one
medium attribute:
medium label :
film attribute :
index information
file name : yyyy0001.jpg
file date : 10 May '98 20:31:43
size : 125.215
Photographing date: 10 May '98 10:11:23
thumb nail
comment
filing information
position information
voice information
modification information
feature information
color matching information
folder
flower
10 May '98
25 sheets
yyyy0001. jpg
yyyy0002. jpg
yyyy0003. jpg
film name : flower
link destination: Q:¥9805¥Hana
date : 10 May '98
comment : sketch of garden
Medium attribute:
medium label :
film attribute :
index information
file name : yyyy0002.jpg
file date : 10 May '98 20:32:11
size : 143.527
photographing date: 10 May '98 10:12:45
thumb nail
comment
filing information
position information
voice information
modification information
feature information
color matching information
exchangeable medium
folder
Kamikohchi
15 June '98
33 sheets
zzzz0001. jpg
zzzz0002. jpg
zzzz0003. jpg
mark indicative of exchangeability
film name : Kamikohchi
Link destination: C:¥photo Kamikohchi
date : 15 June '98
comment : hiking at Kamikohchi
medium attribute: exchangeable Read Only
Medium label: photo in '98
film attribute : password

Fig. 7

```
//
private: attribute
    USHORT m_nMask;          //  mask flag indicative of effective member
    SHORT m_x1;              //  trimming start x coordinate
    SHORT m_y1;              //  trimming start y coordinate
    SHORT m_x2;              //  trimming end x coordinate
    SHORT m_y2;              //  trimming end y coordinate
    SHORT m_nRotation;       //  rotating angle
    SHORT m_nApf;            //  automatic image modification
    SHORT m_nRed;            //  red
    SHORT m_nGreen;          //  green
    SHORT m_nBlue;           //  blue
    SHORT m_nBrightness;     //  brightness
    SHORT m_nContrast;       //  contrast
```

Fig. 8



09529665.060300

Fig. 9

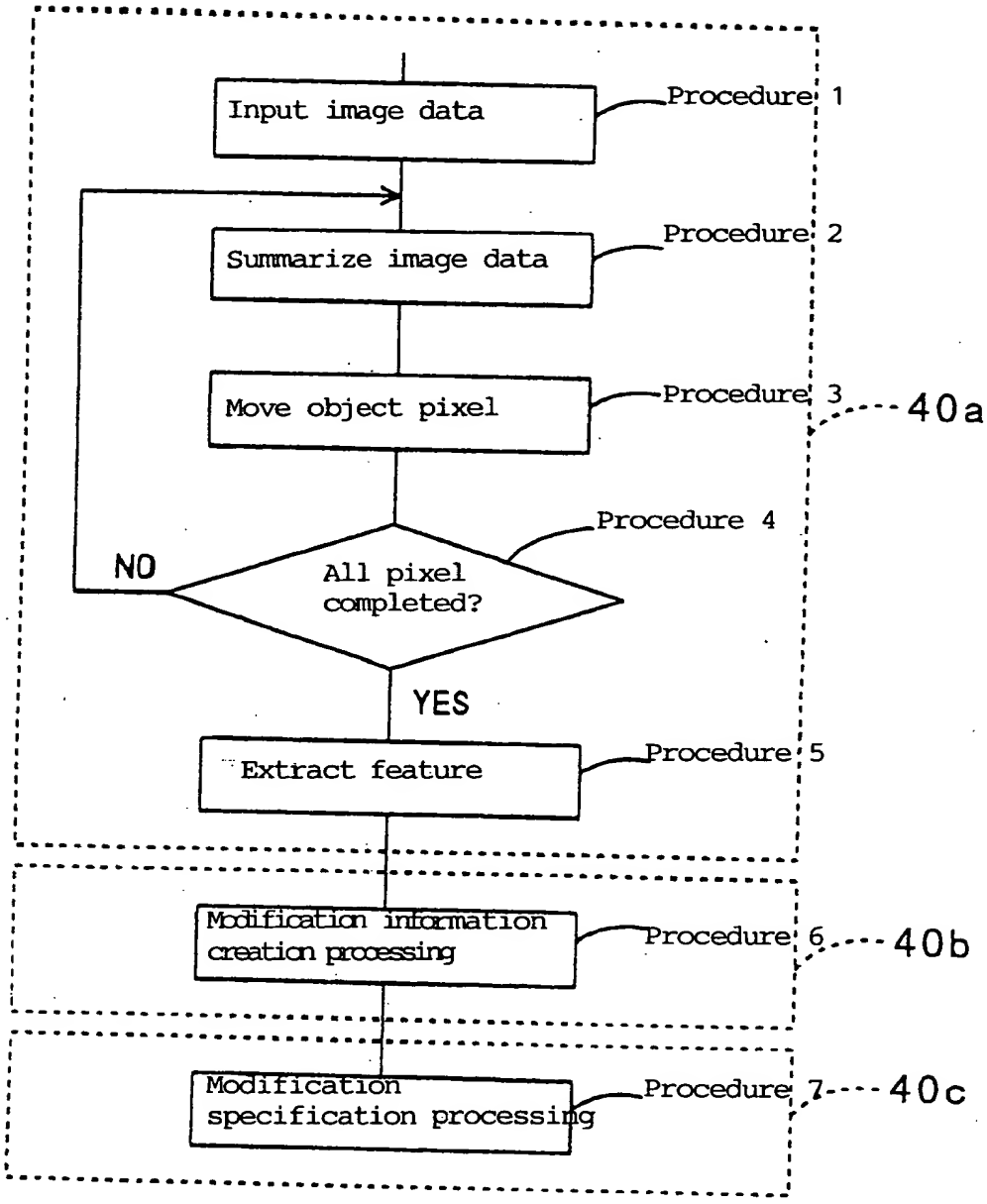
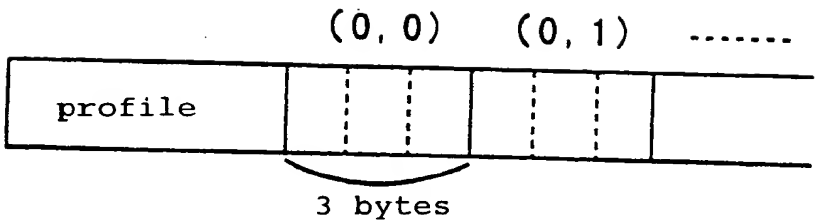
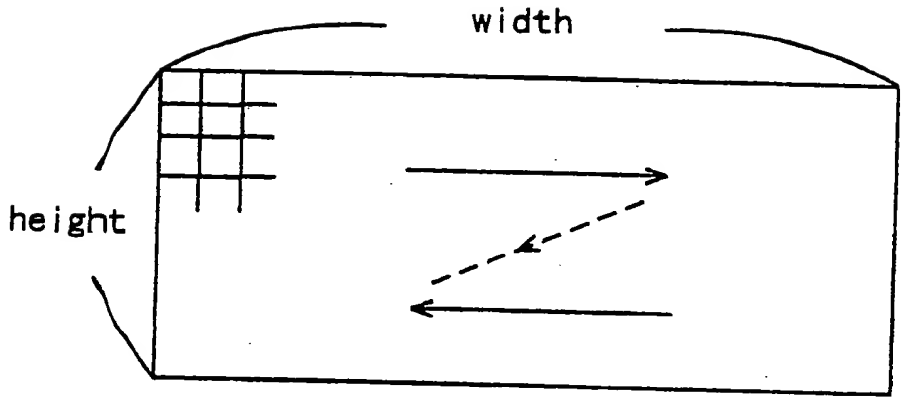

Input image data
Procedure 1
Summarize image data
Procedure 2
Move object pixel
Procedure 3
40a
Procedure 4
NO
All pixel completed?
YES
Extract feature
Procedure 5
Modification information creation processing
Procedure 6
40b
Modification specification processing
Procedure 7
40c

Fig. 10



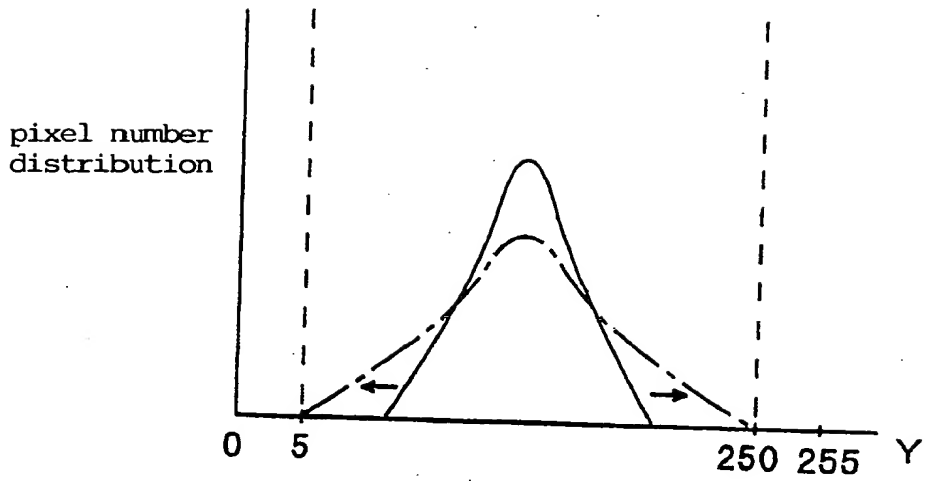
09529665.050300

Fig. 11



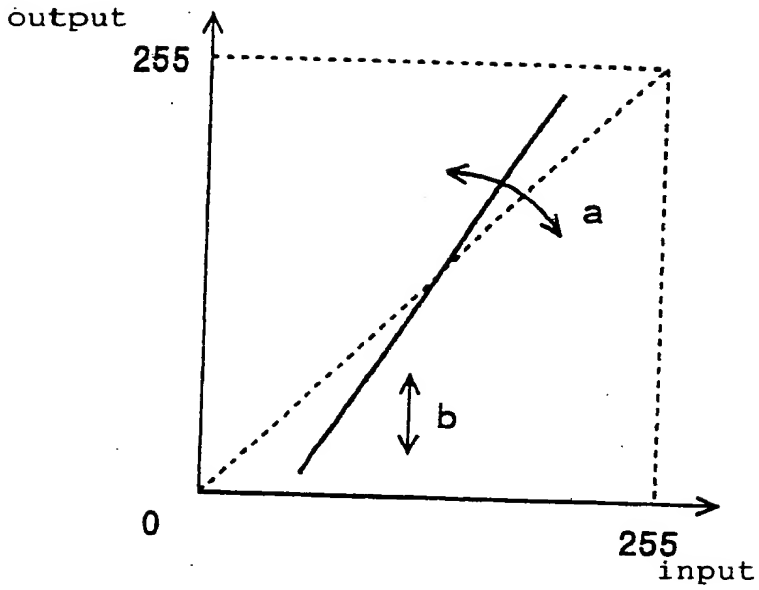
09529665.030300

Fig. 12



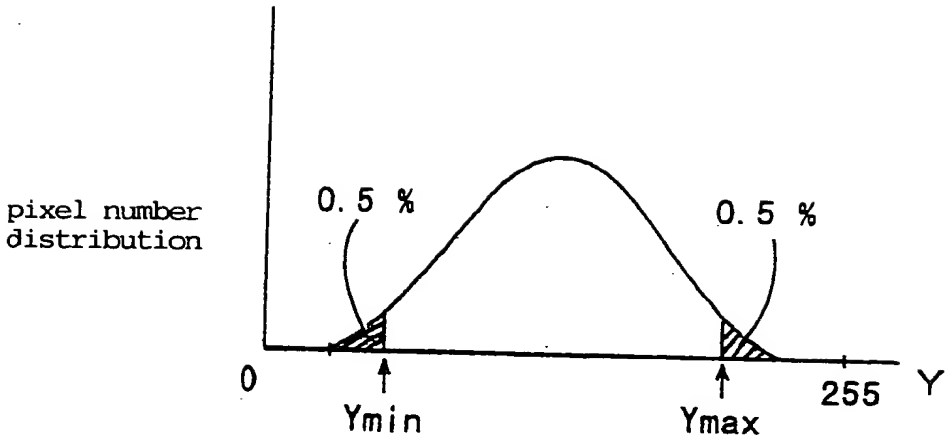
09529665 050600

Fig. 13



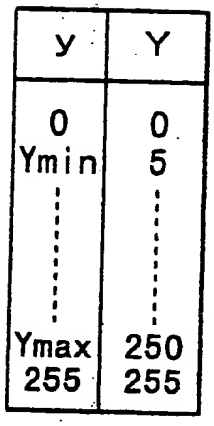
09529665 050200

Fig. 14



09529665.030200

Fig. 15



09529665.050600

Fig. 16

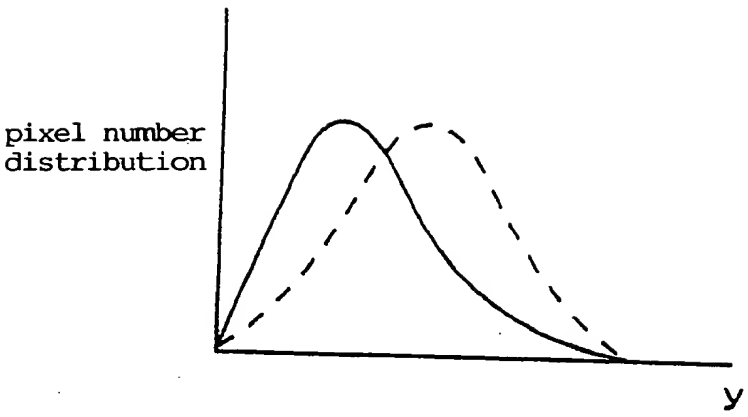
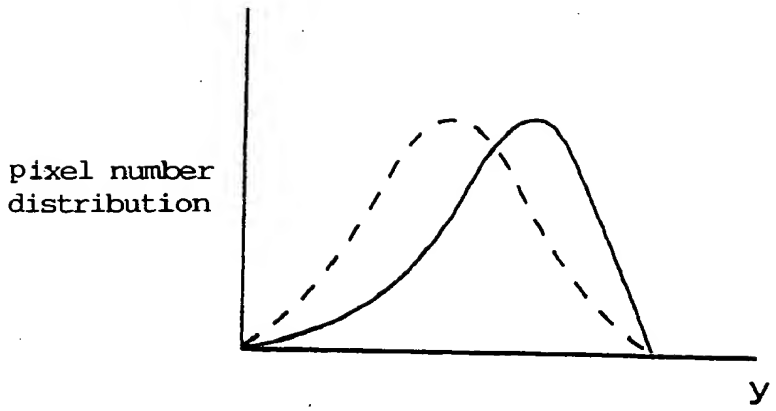
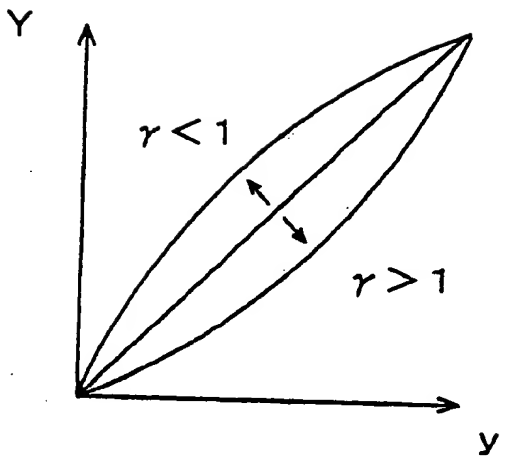


Fig. 17



09529665.050600

Fig. 18



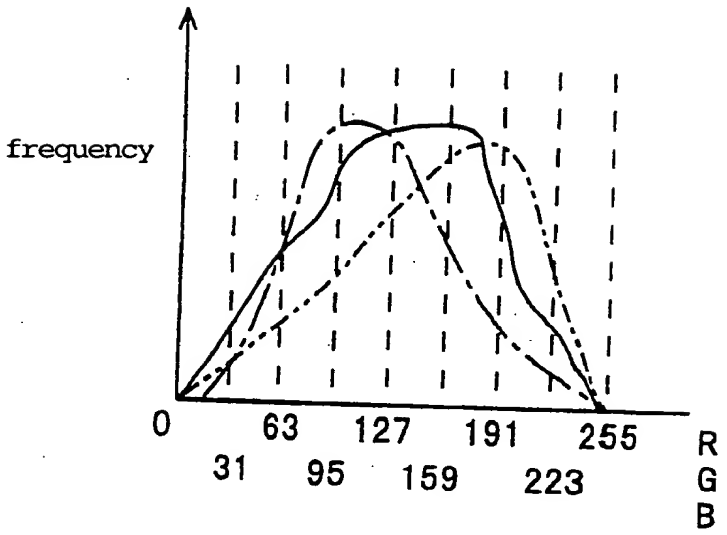
09529665.050600

Fig. 19

Ymed_target-Ymed	γ
+20	0.80
+15	0.85
+10	0.90
+5	0.95
0	1
−5	1.05
−10	1.10
−15	1.15
−20	1.20

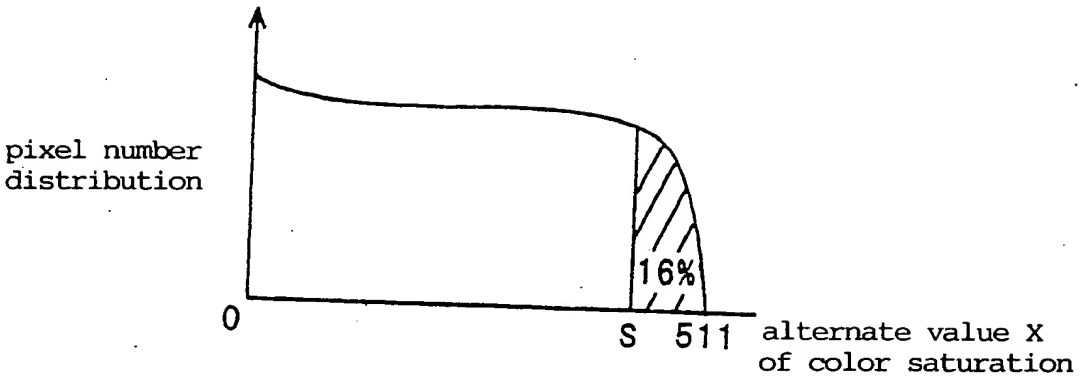
09529665.090800

Fig. 20



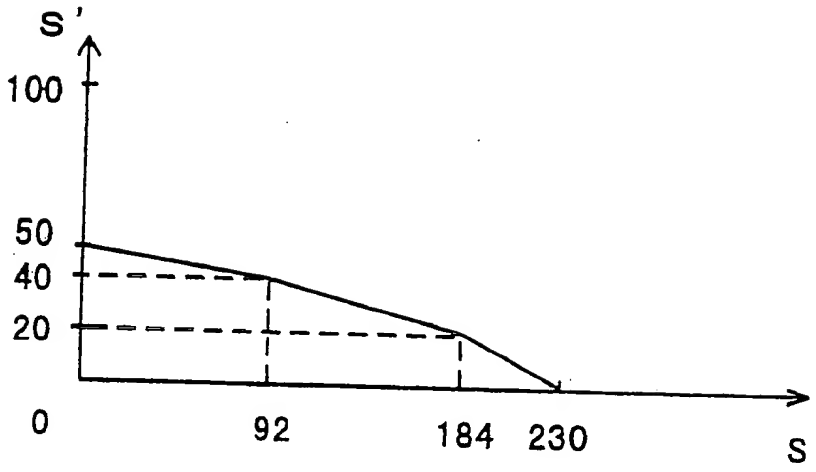
09529665.050300

Fig. 21



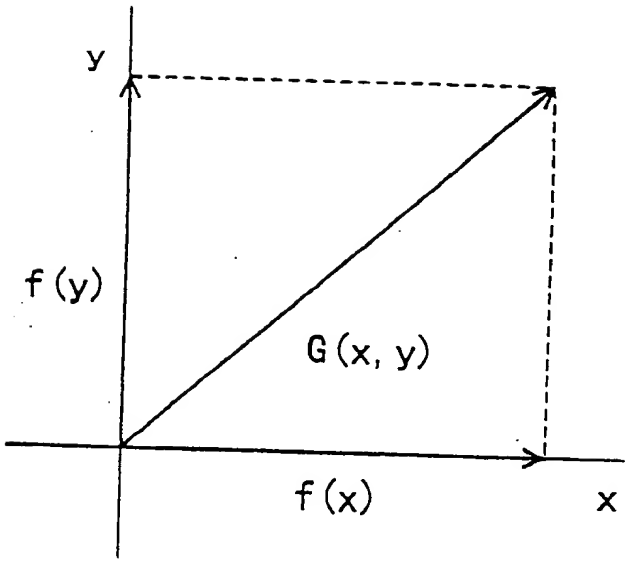
09529665.060300

Fig. 22



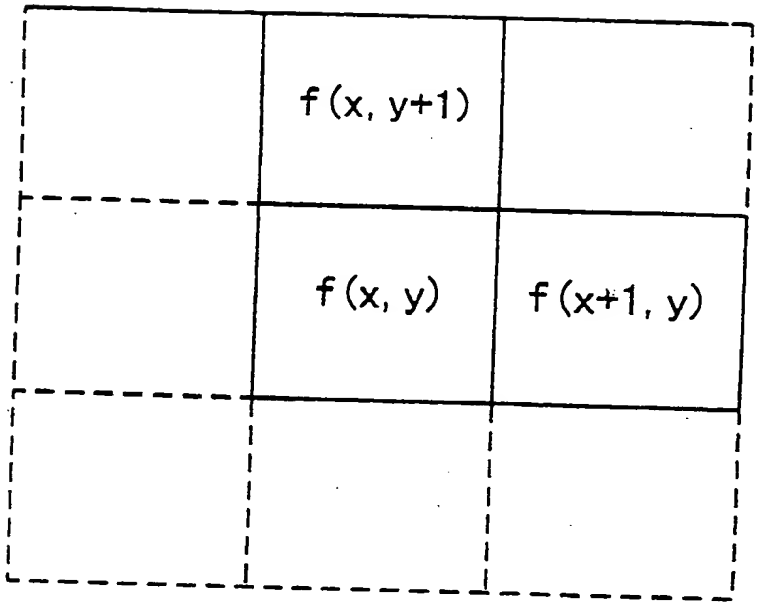
09529665 - 060300

Fig. 23



09529665 - 050600

Fig. 24



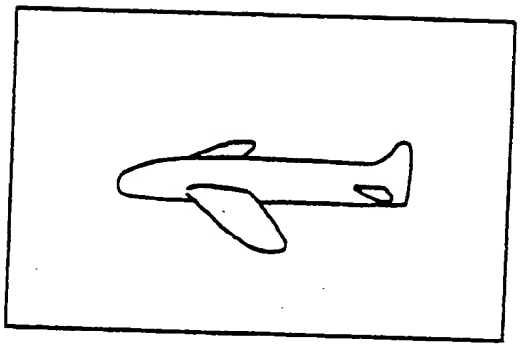
09529665.050300

Fig. 25

f (x−1, y+1)	f (x, y+1)	f (x+1, y+1)
f (x−1, y)	f (x, y)	f (x+1, y)
f (x−1, y−1)	f (x, y−1)	f (x+1, y−1)

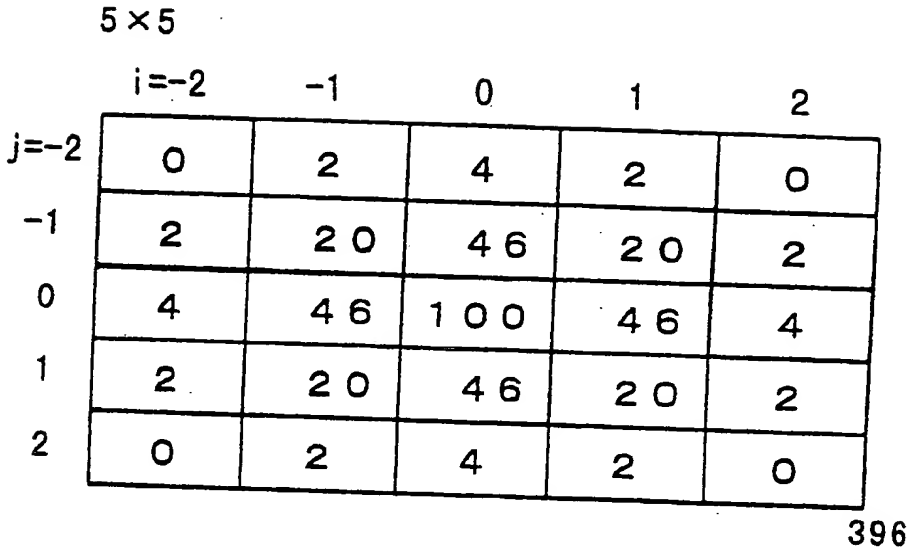
09529665 - 050300

Fig. 26



09529665.060300

Fig. 27



09529665.050300

Fig. 28

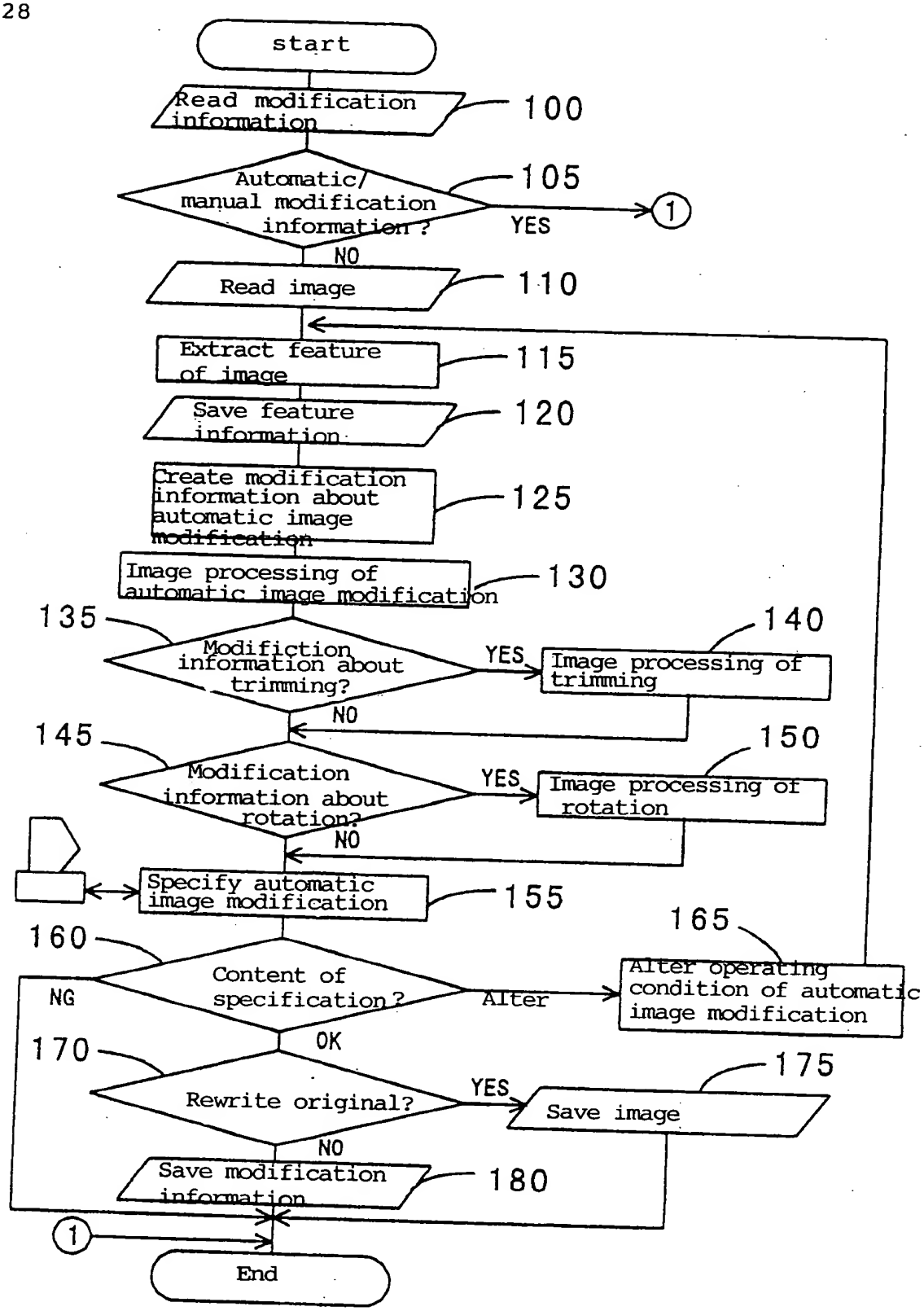

start
Read modification information
100
Automatic/ manual modification information ?
105
YES
1
NO
Read image
110
Extract feature of image
115
Save feature information
120
Create modification information about automatic image modification
125
Image processing of automatic image modification
130
135
Modifiction information about trimming?
YES
140
Image processing of trimming
NO
145
Modification information about rotation?
YES
150
Image processing of rotation
NO
Specify automatic image modification
155
160
Content of specification?
NG
Alter
165
Alter operating condition of automatic image modification
OK
170
Rewrite original?
YES
175
Save image
NO
Save modification information
180
1
End

Fig. 29

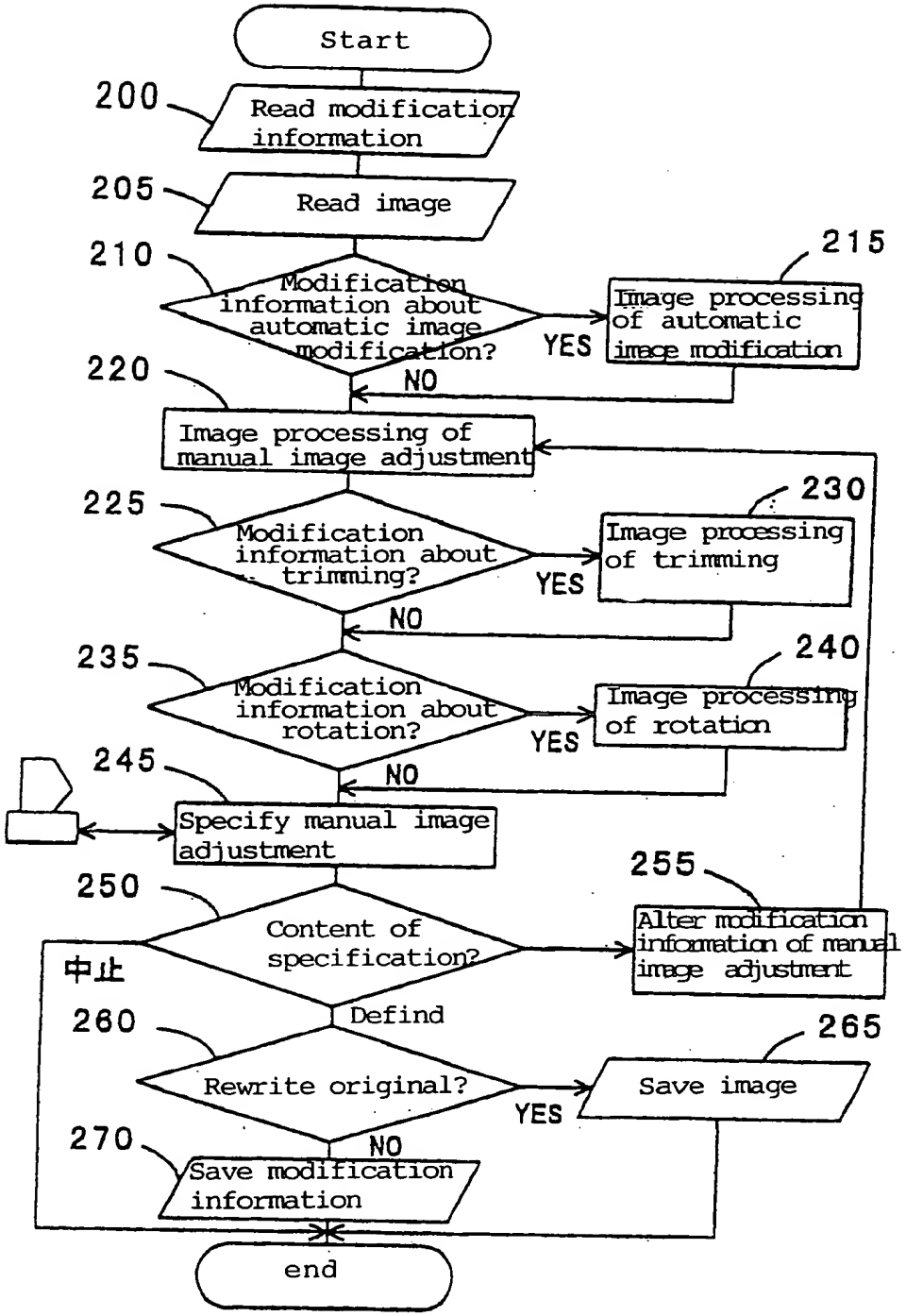

Start
200
Read modification information
205
Read image
210
Modification information about automatic image modification?
YES
215
Image processing of automatic image modification
NO
220
Image processing of manual image adjustment
225
Modification information about trimming?
YES
230
Image processing of trimming
NO
235
Modification information about rotation?
YES
240
Image processing of rotation
NO
245
Specify manual image adjustment
250
Content of specification?
中止
255
Alter modification information of manual image adjustment
Defind
260
Rewrite original?
YES
265
Save image
NO
270
Save modification information
end

Fig. 30

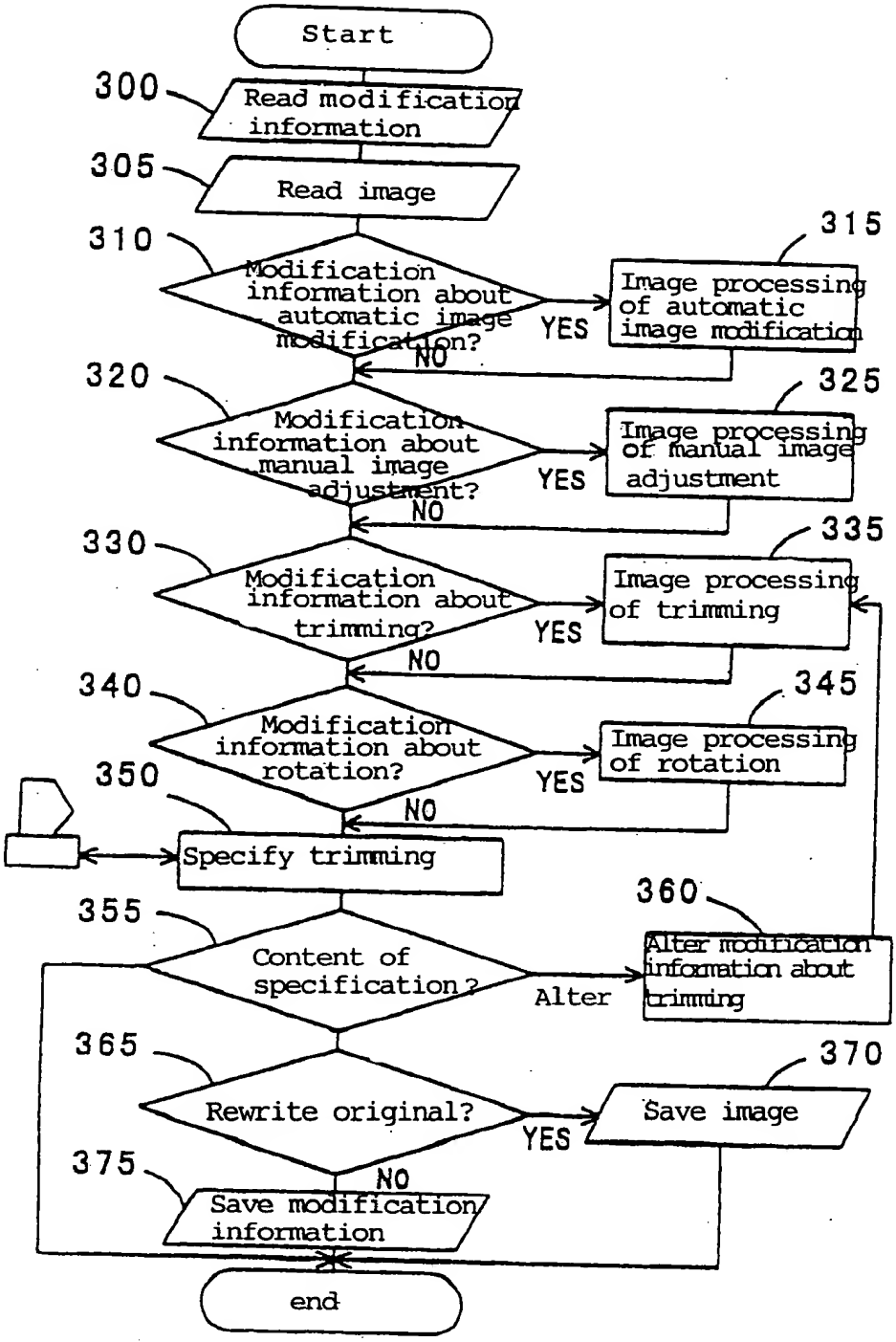

Start
300
Read modification information
305
Read image
310
Modification information about automatic image modification?
YES
315
Image processing of automatic image modification
NO
320
Modification information about manual image adjustment?
YES
325
Image processing of manual image adjustment
NO
330
Modification information about trimming?
YES
335
Image processing of trimming
NO
340
Modification information about rotation?
YES
345
Image processing of rotation
NO
350
Specify trimming
355
Content of specification?
Alter
360
Alter modification information about trimming
365
Rewrite original?
YES
370
Save image
NO
375
Save modification information
end

Fig. 31

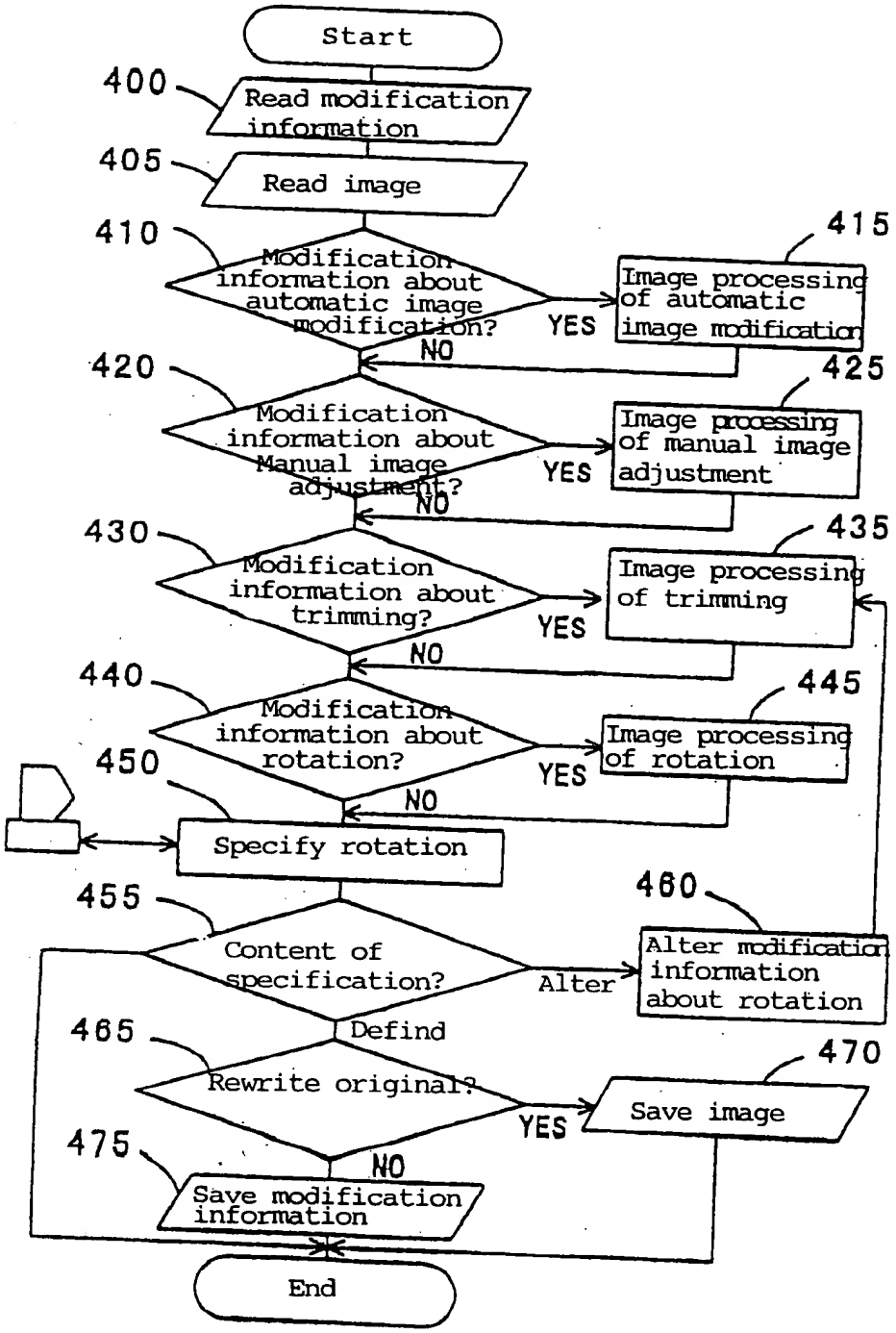

Start
400
Read modification information
405
Read image
410
Modification information about automatic image modification?
YES
415
Image processing of automatic image modification
NO
420
Modification information about Manual image adjustment?
YES
425
Image processing of manual image adjustment
NO
430
Modification information about trimming?
YES
435
Image processing of trimming
NO
440
Modification information about rotation?
YES
445
Image processing of rotation
NO
450
Specify rotation
455
Content of specification?
Alter
460
Alter modification information about rotation
Defind
465
Rewrite original?
YES
470
Save image
NO
475
Save modification information
End

Fig. 32

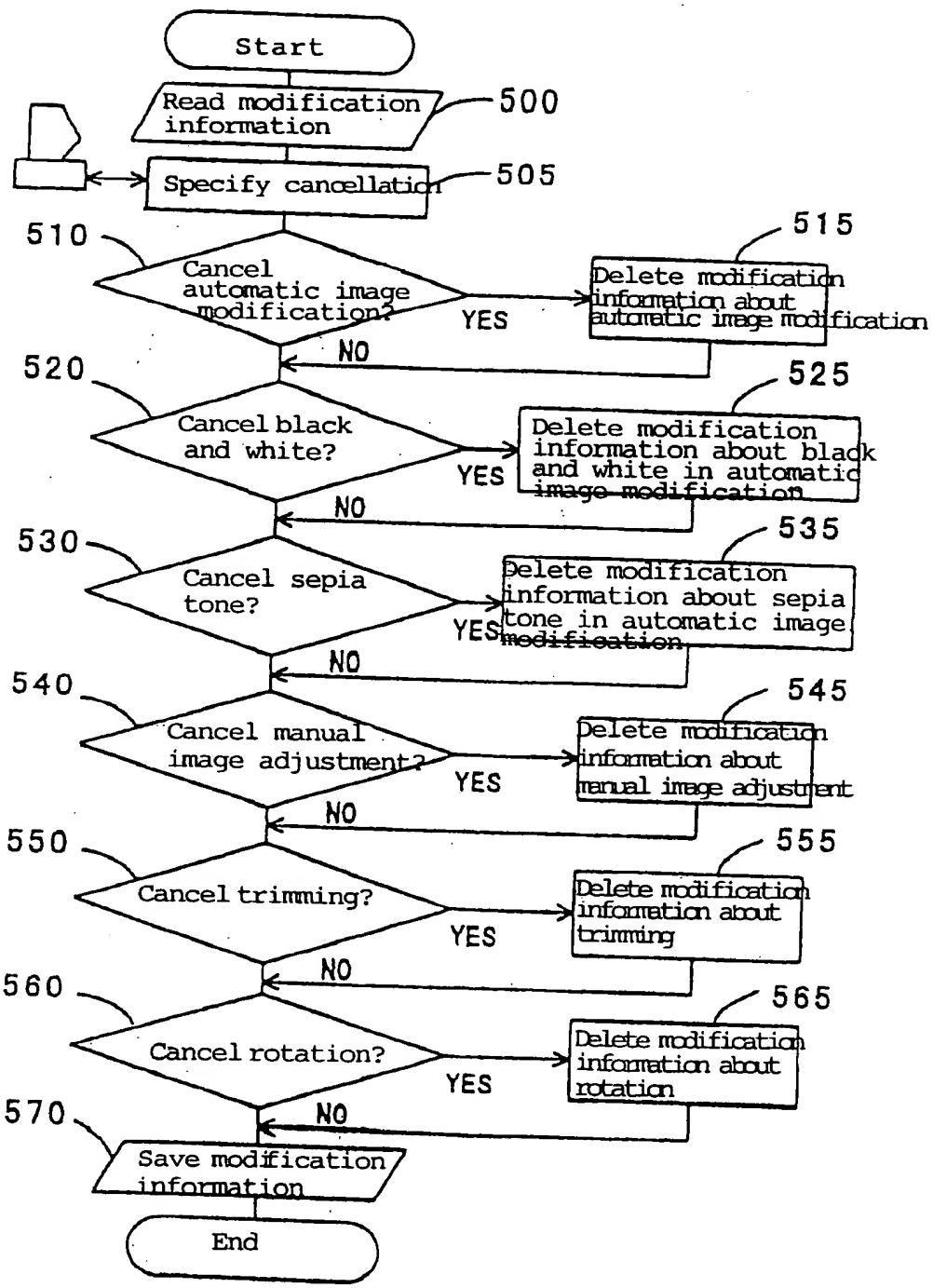

Start
Read modification information
500
Specify cancellation
505
510
Cancel automatic image modification?
YES
515
Delete modification information about automatic image modification
NO
520
Cancel black and white?
YES
525
Delete modification information about black and white in automatic image modification
NO
530
Cancel sepia tone?
YES
535
Delete modification information about sepia tone in automatic image modification
NO
540
Cancel manual image adjustment?
YES
545
Delete modification information about manual image adjustment
NO
550
Cancel trimming?
YES
555
Delete modification information about trimming
NO
560
Cancel rotation?
YES
565
Delete modification information about rotation
NO
570
Save modification information
End

Fig. 33

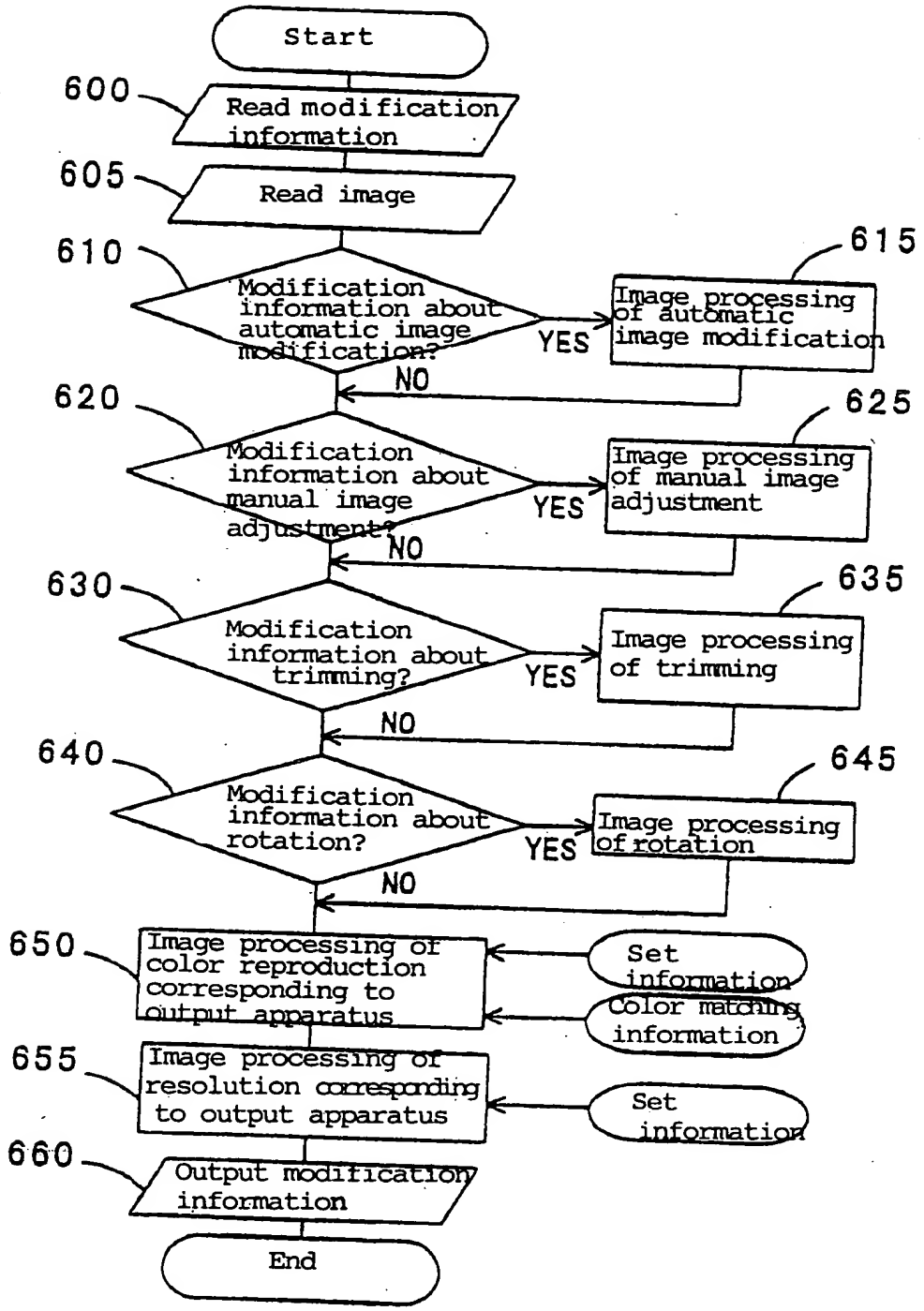
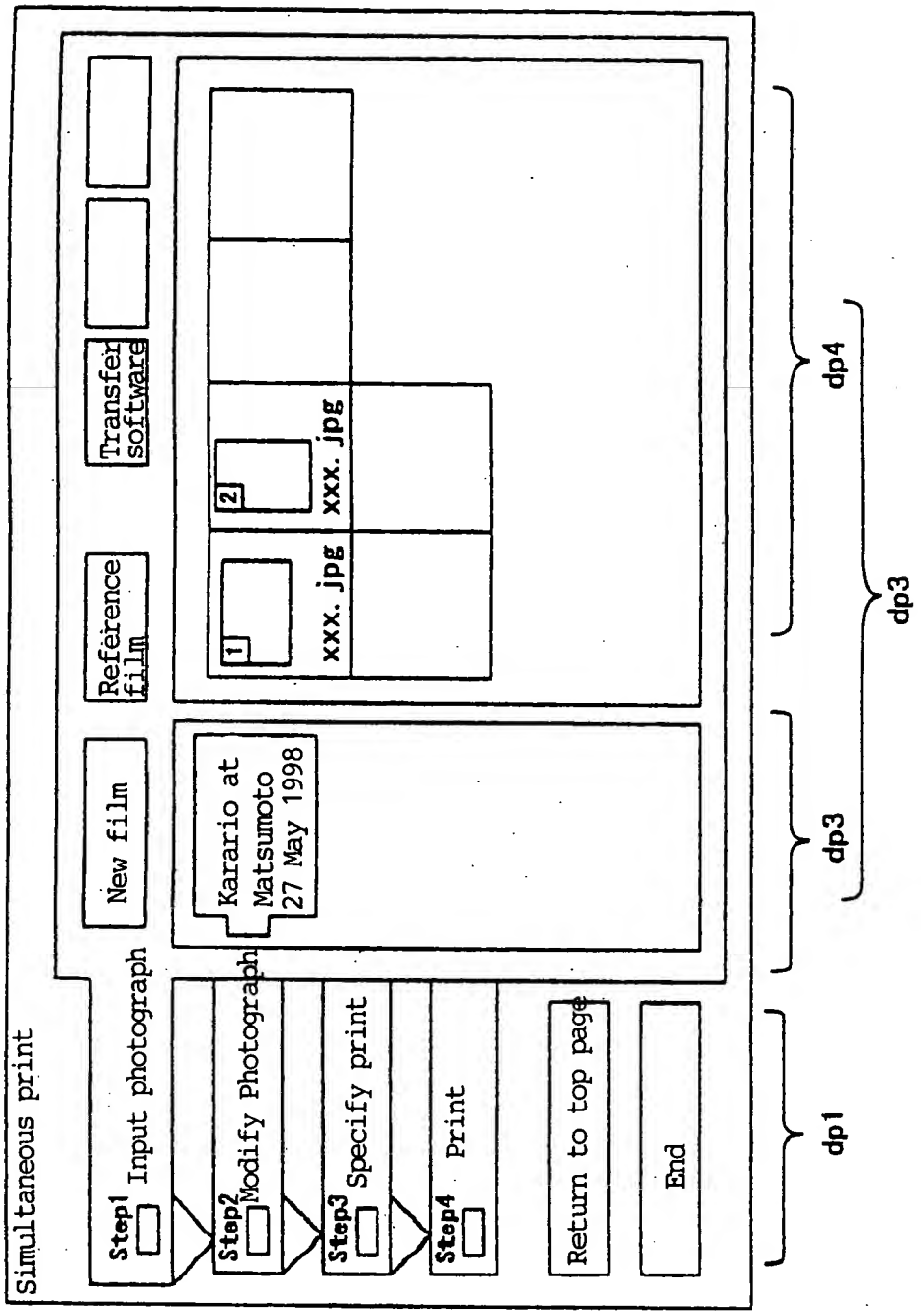
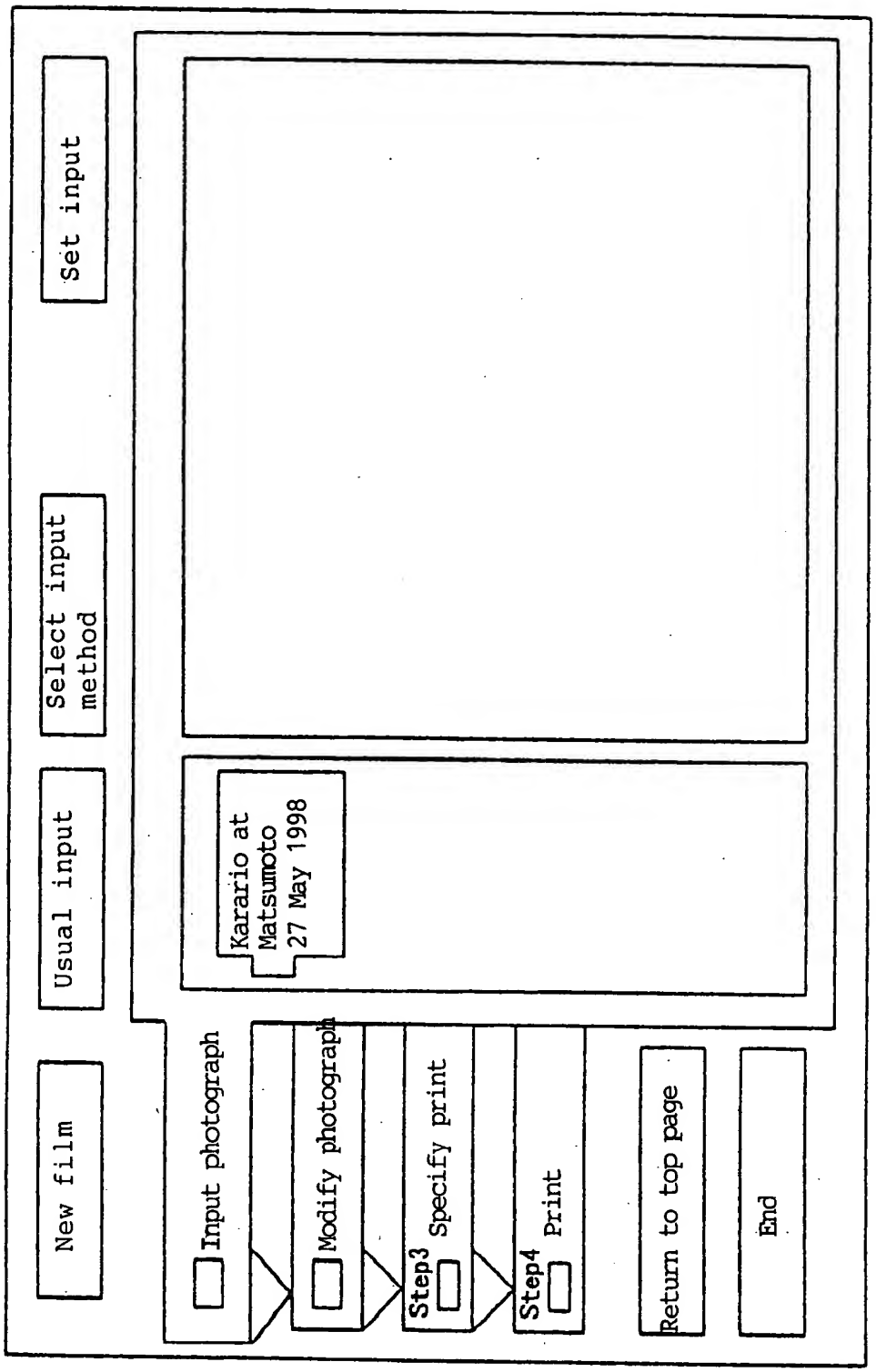

Start
600
Read modification information
605
Read image
610
Modification information about automatic image modification?
YES
615
Image processing of automatic image modification
NO
620
Modification information about manual image adjustment?
YES
625
Image processing of manual image adjustment
NO
630
Modification information about trimming?
YES
635
Image processing of trimming
NO
640
Modification information about rotation?
YES
645
Image processing of rotation
NO
650
Image processing of color reproduction corresponding to output apparatus
Set information
Color matching information
655
Image processing of resolution corresponding to output apparatus
Set information
660
Output modification information
End

Fig. 34



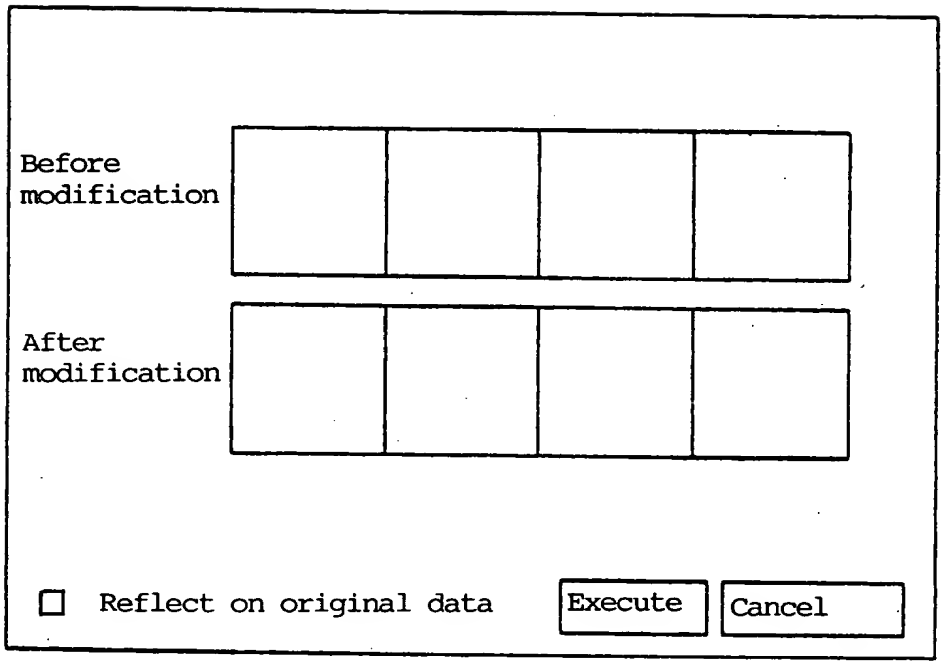
0082901 "596256"

Fig. 35



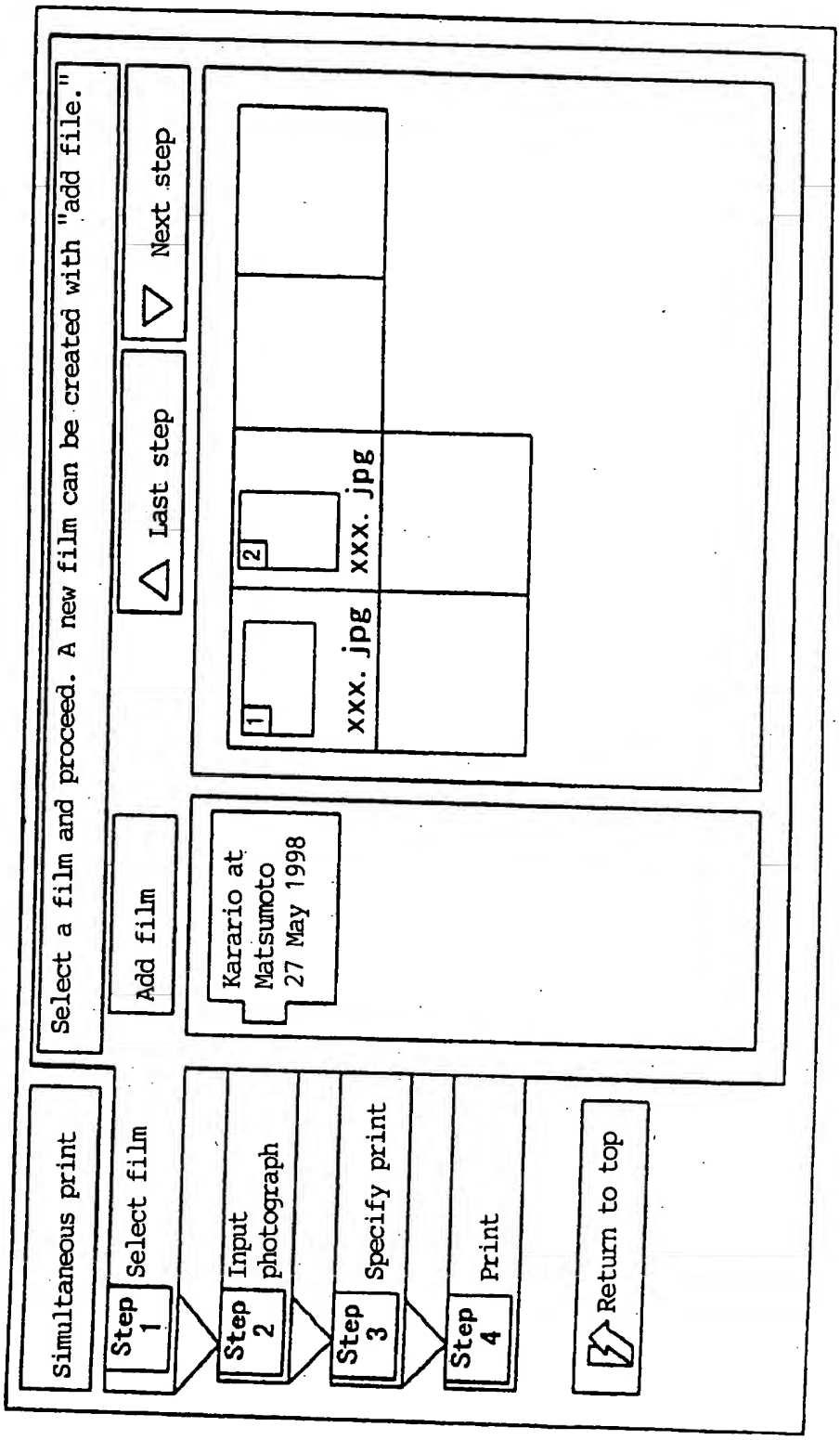
0003901 596256D

Fig. 36



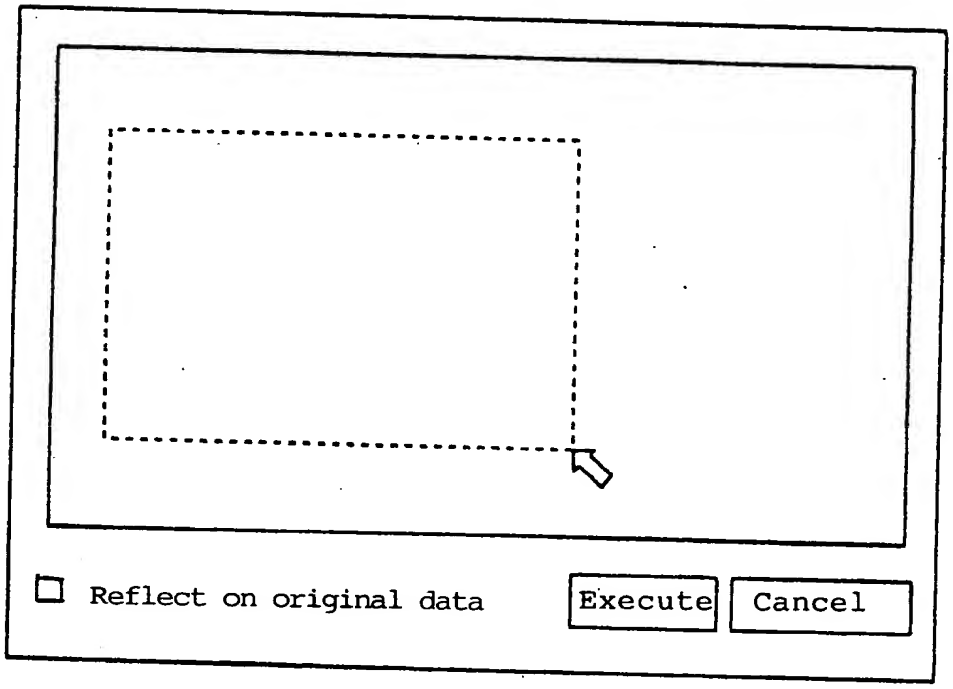
09529665.090300

Fig. 37



0003903 "59525260

Fig. 38



09529665.060300

Fig. 39

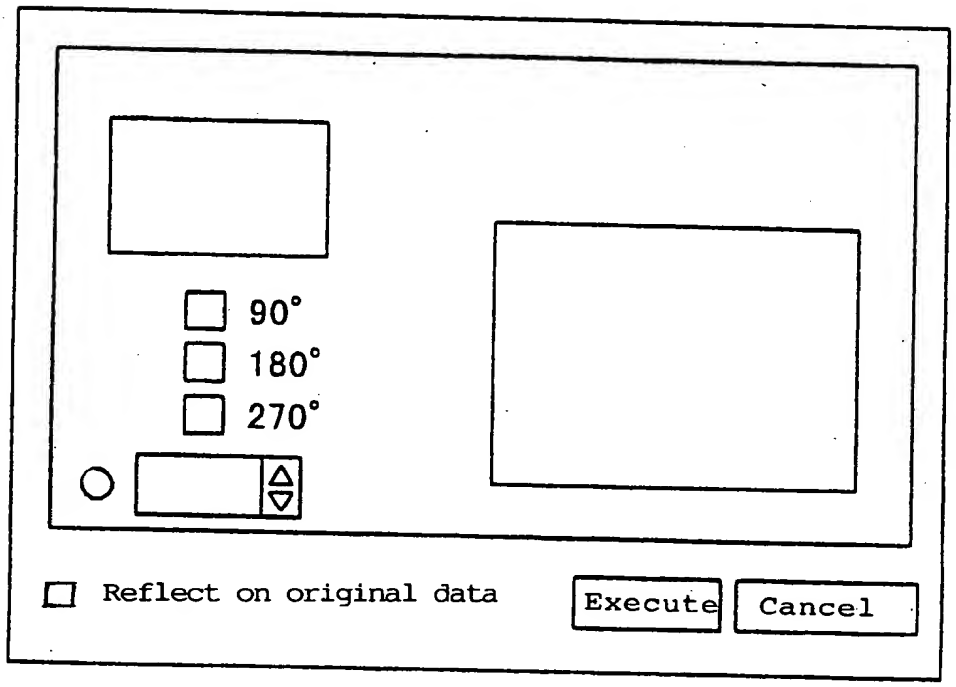
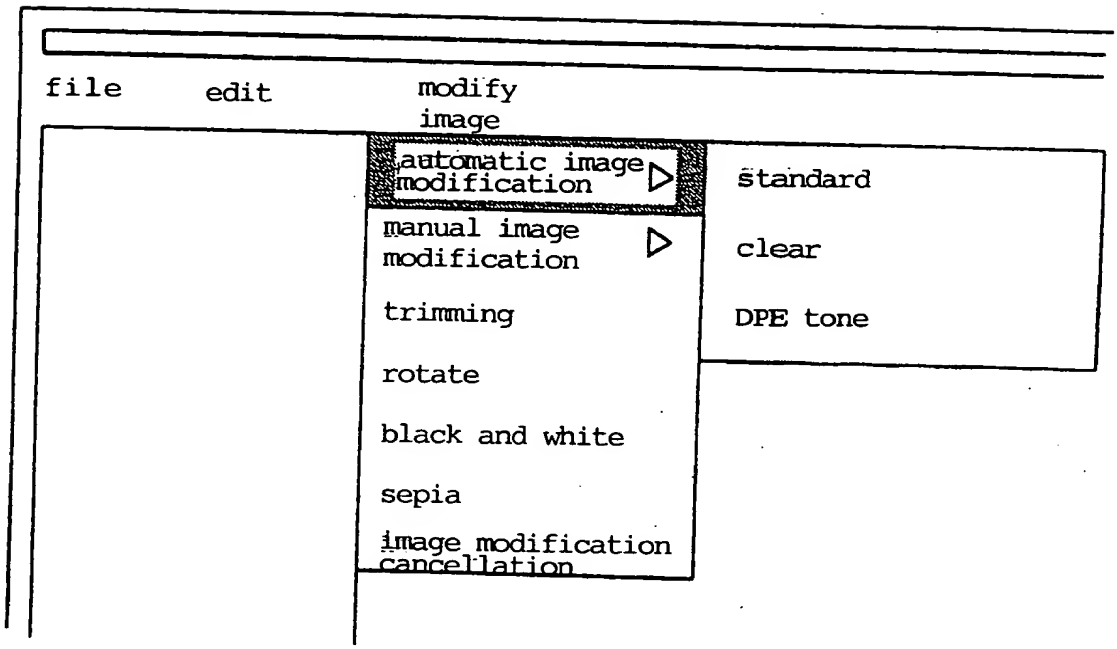


Fig. 40



0955665.053000

Fig. 41

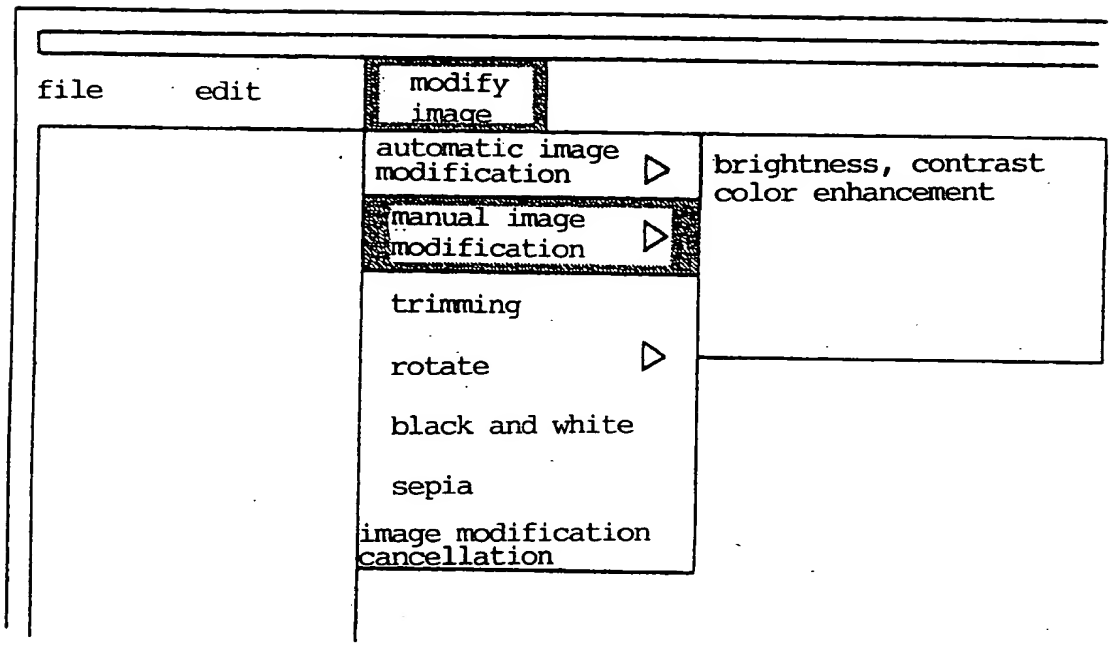
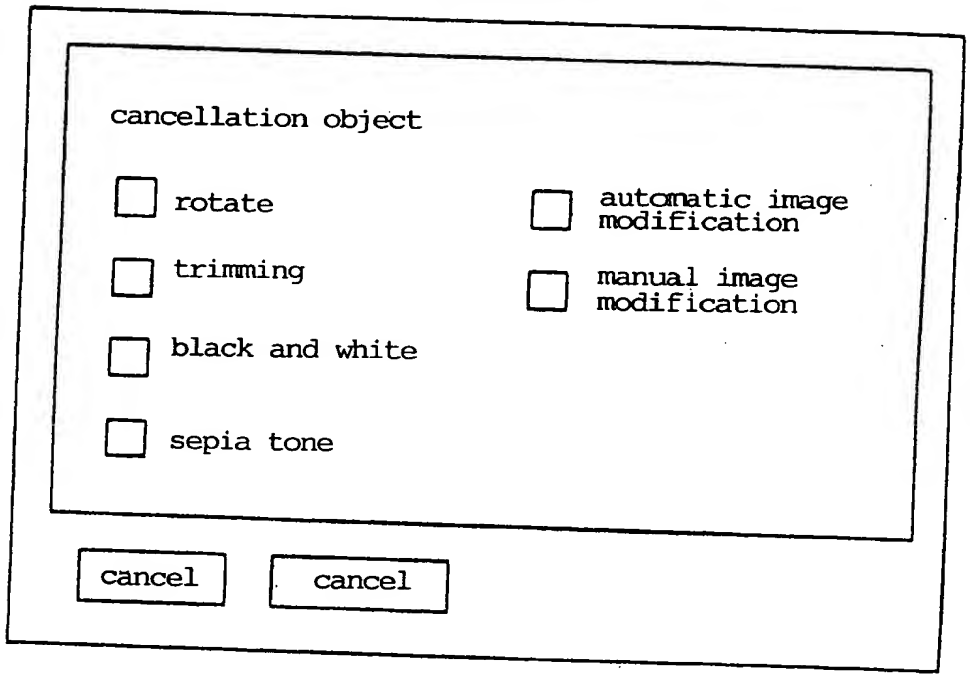
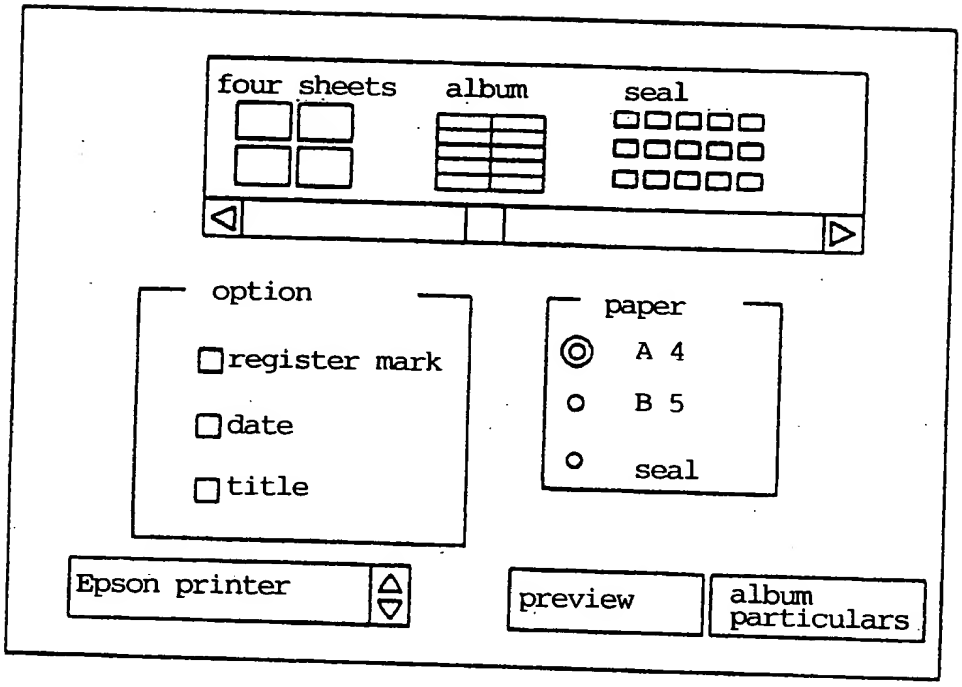

file
edit
modify image
automatic image modification
manual image modification
brightness, contrast
color enhancement
trimming
rotate
black and white
sepia
image modification cancellation

Fig. 42



09529665.090300

Fig. 43



09529665.060300

Fig. 44

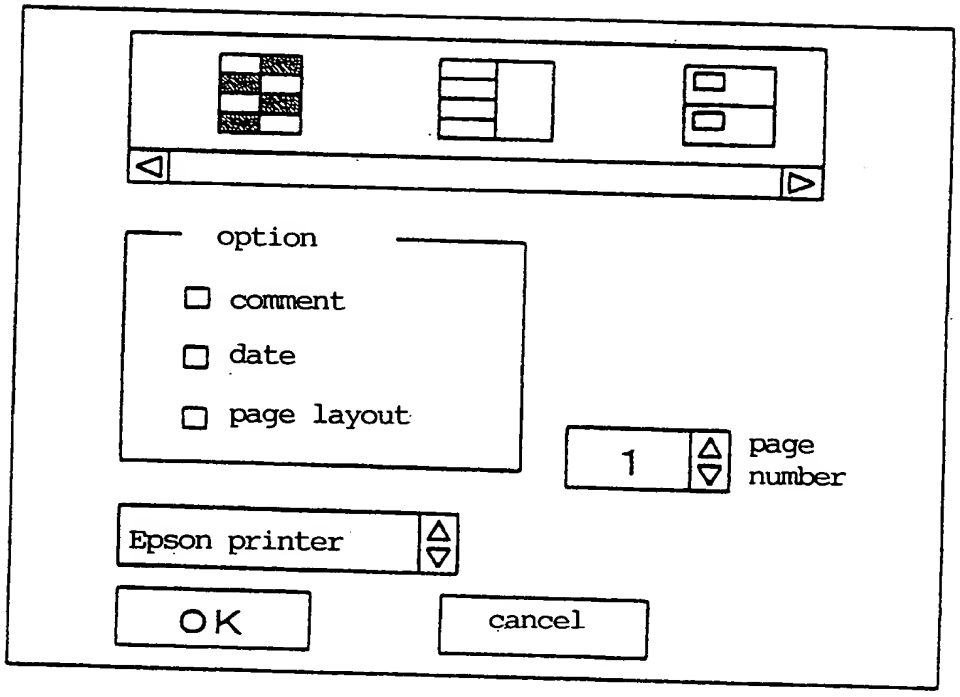
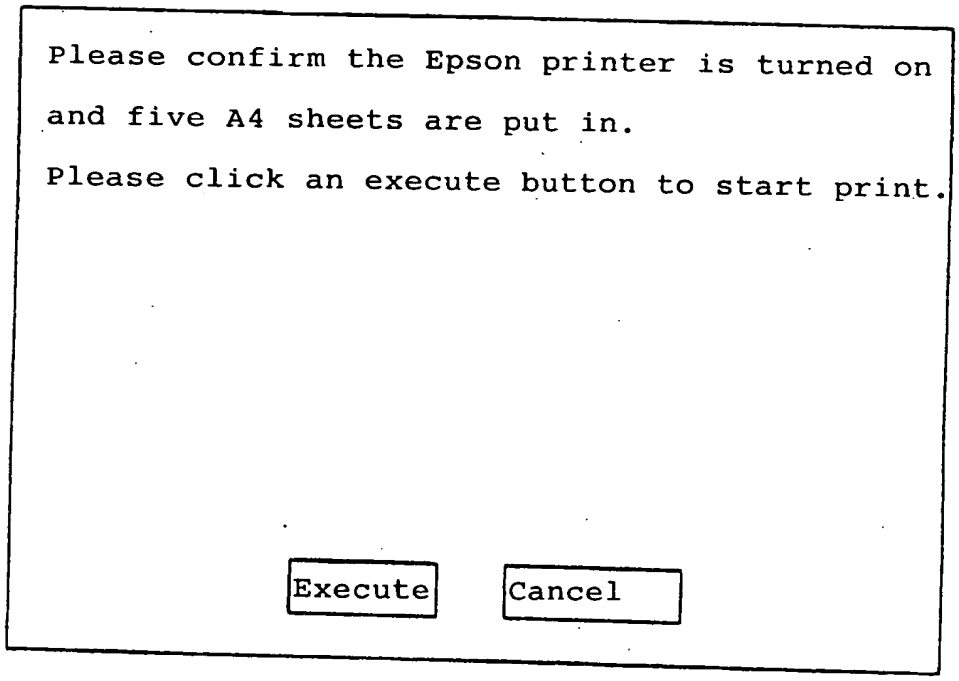

option
comment
date
page layout
1
page number
Epson printer
OK
cancel

Fig. 45



09529665.090900

Fig. 46

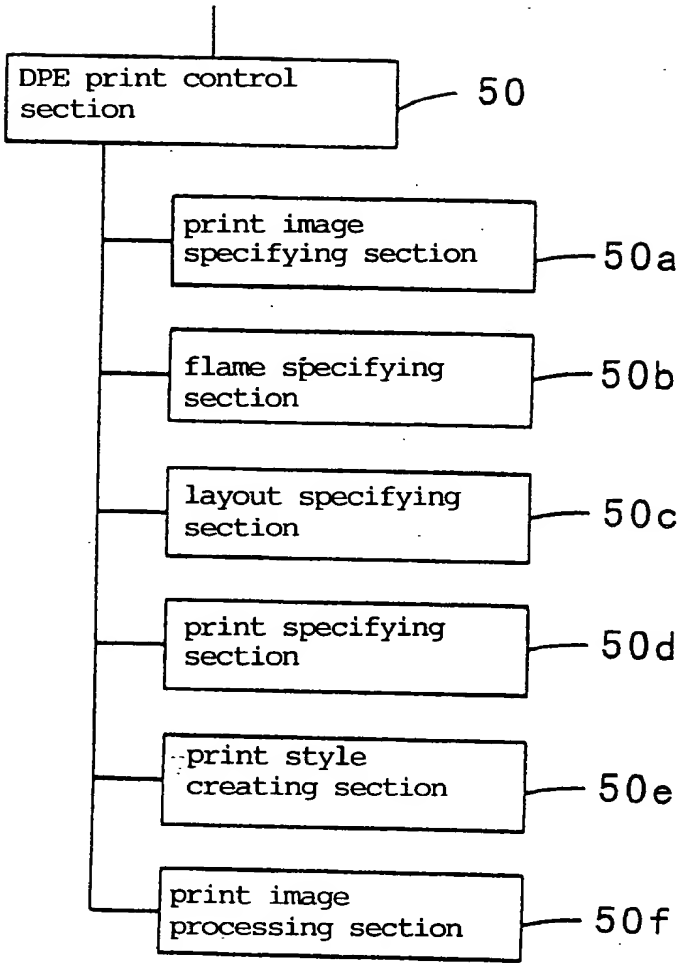
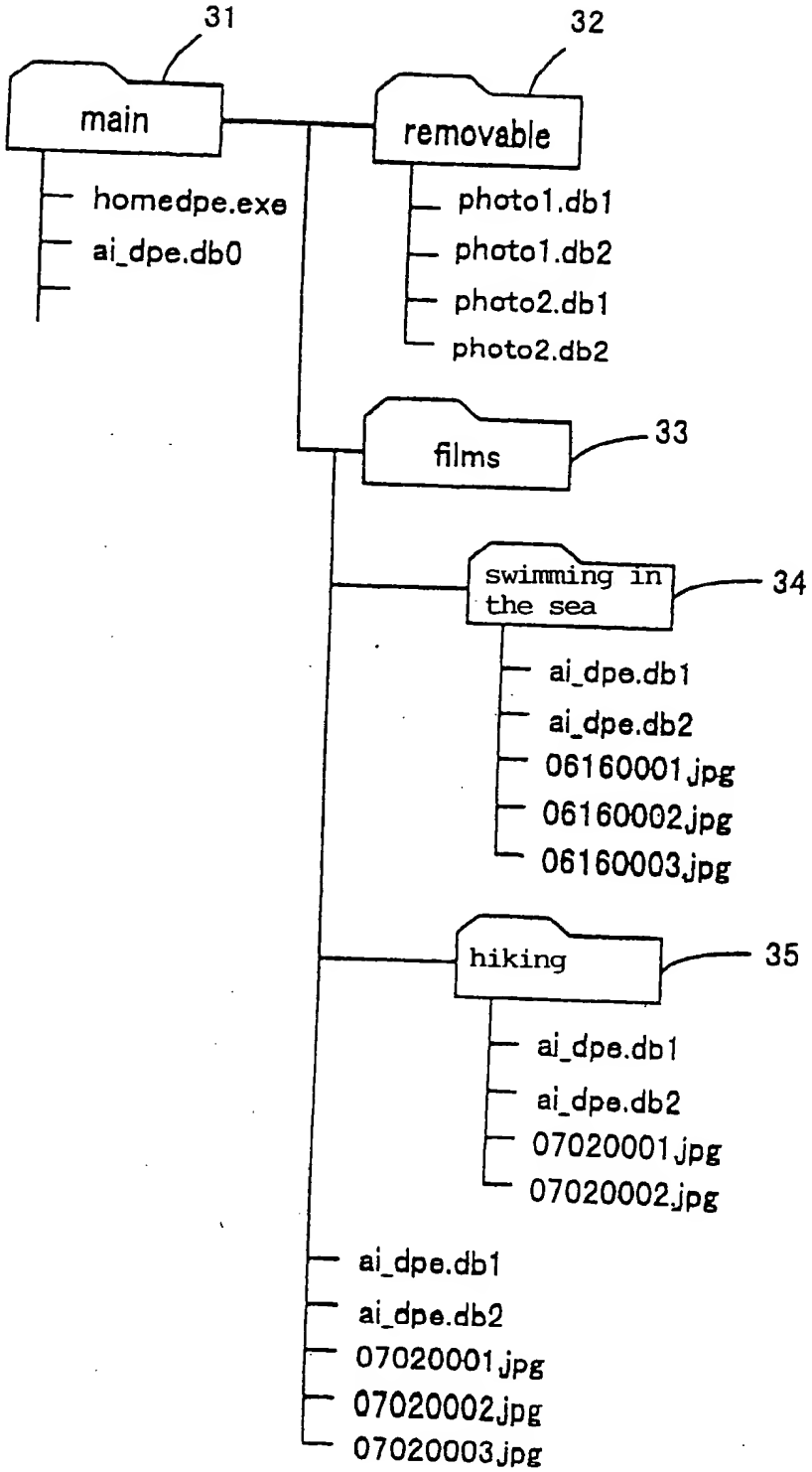
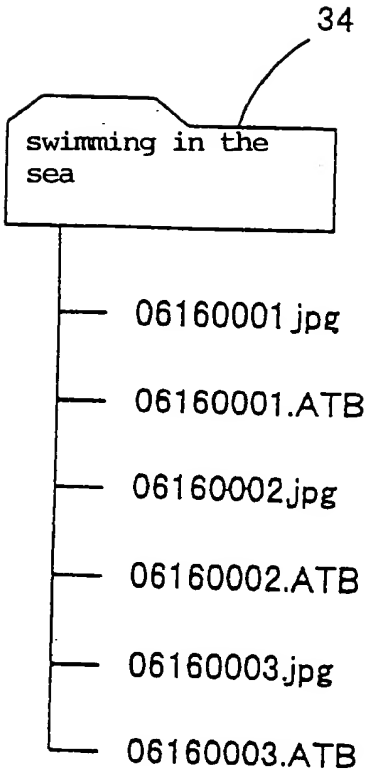

DPE print control section
50
print image specifying section
50a
flame specifying section
50b
layout specifying section
50c
print specifying section
50d
print style creating section
50e
print image processing section
50f

Fig. 47



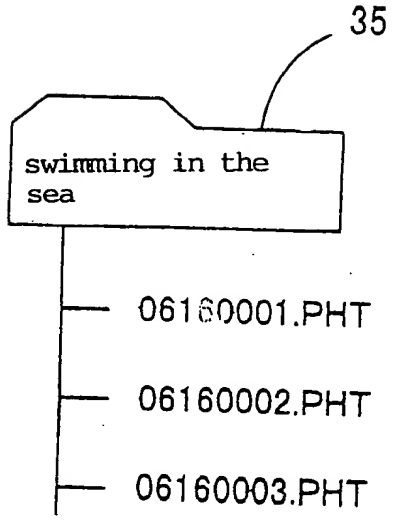
0529665.050900

Fig. 48



09529665 - 050300

Fig. 49



(a)

(b) ××××.PHT { jpg, ATB, ENG }

09529665.060900

Fig. 50

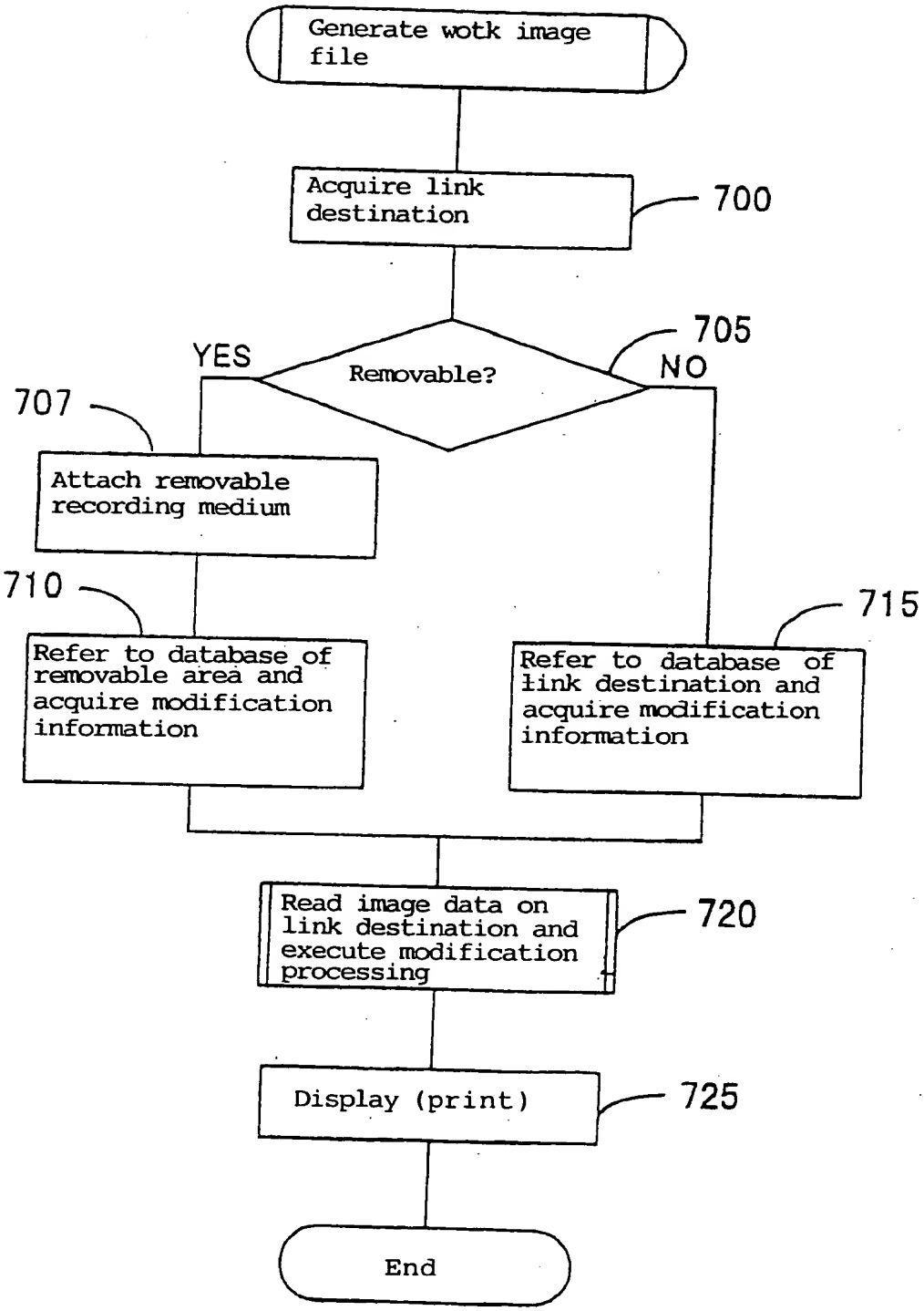
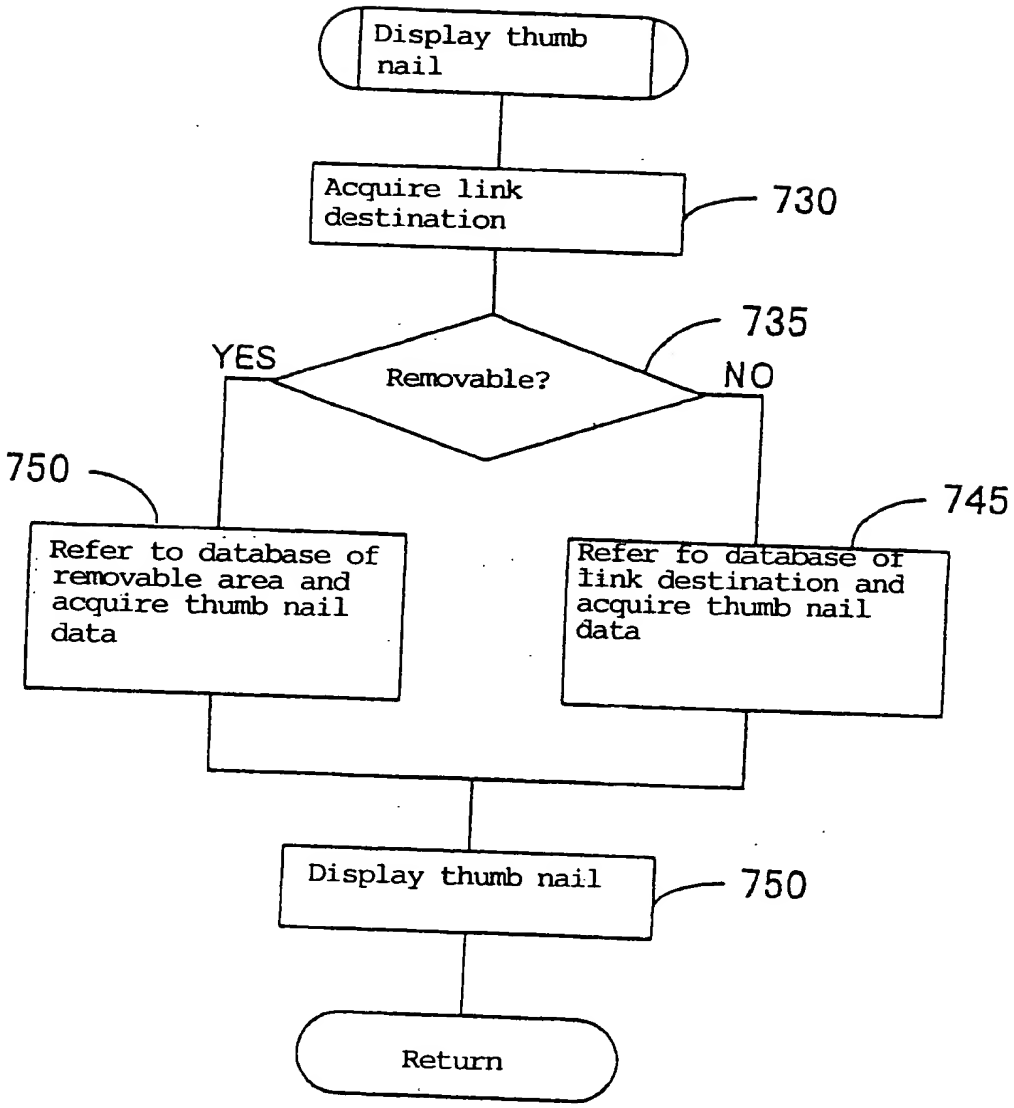

Generate wotk image file
Acquire link destination
700
Removable?
705
YES
NO
707
Attach removable recording medium
710
Refer to database of removable area and acquire modification information
715
Refer to database of link destination and acquire modification information
Read image data on link destination and execute modification processing
720
Display (print)
725
End

Fig. 51

0952965 - 053000

```
private :
        char [100]      PATRONE  ;
        char [1000]     f_PICT   ;
```

Fig. 52



09529665.060300

Fig. 53

processing	engine	order	processing intensity
automatic image modification	V1	1	1
brightness	V1	0	0
contrast	V1	0	0
red	V1	0	0
green	V1	0	0
blue	V1	0	0

(a)

processing	engine	order	processing intensity
automatic image modification	V1	0	0
brightness	V2	4	+2
contrast	V2	5	+3
red	V2	1	+1
green	V2	2	+1
blue	V2	3	−1

(b)

05529665 - 053000

Fig. 54

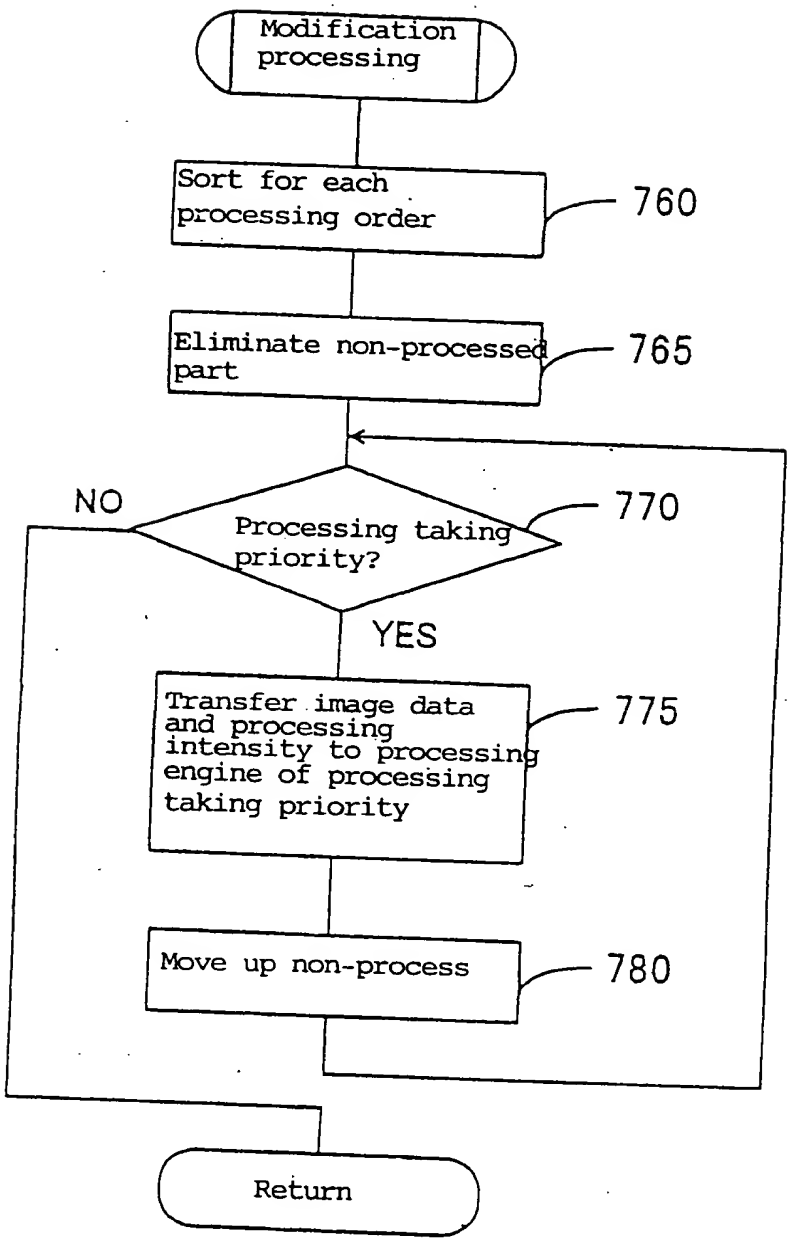

Modification processing
Sort for each processing order
760
Eliminate non-processed part
765
NO
Processing taking priority?
770
YES
Transfer image data and processing intensity to processing engine of processing taking priority
775
Move up non-process
780
Return

Fig. 55

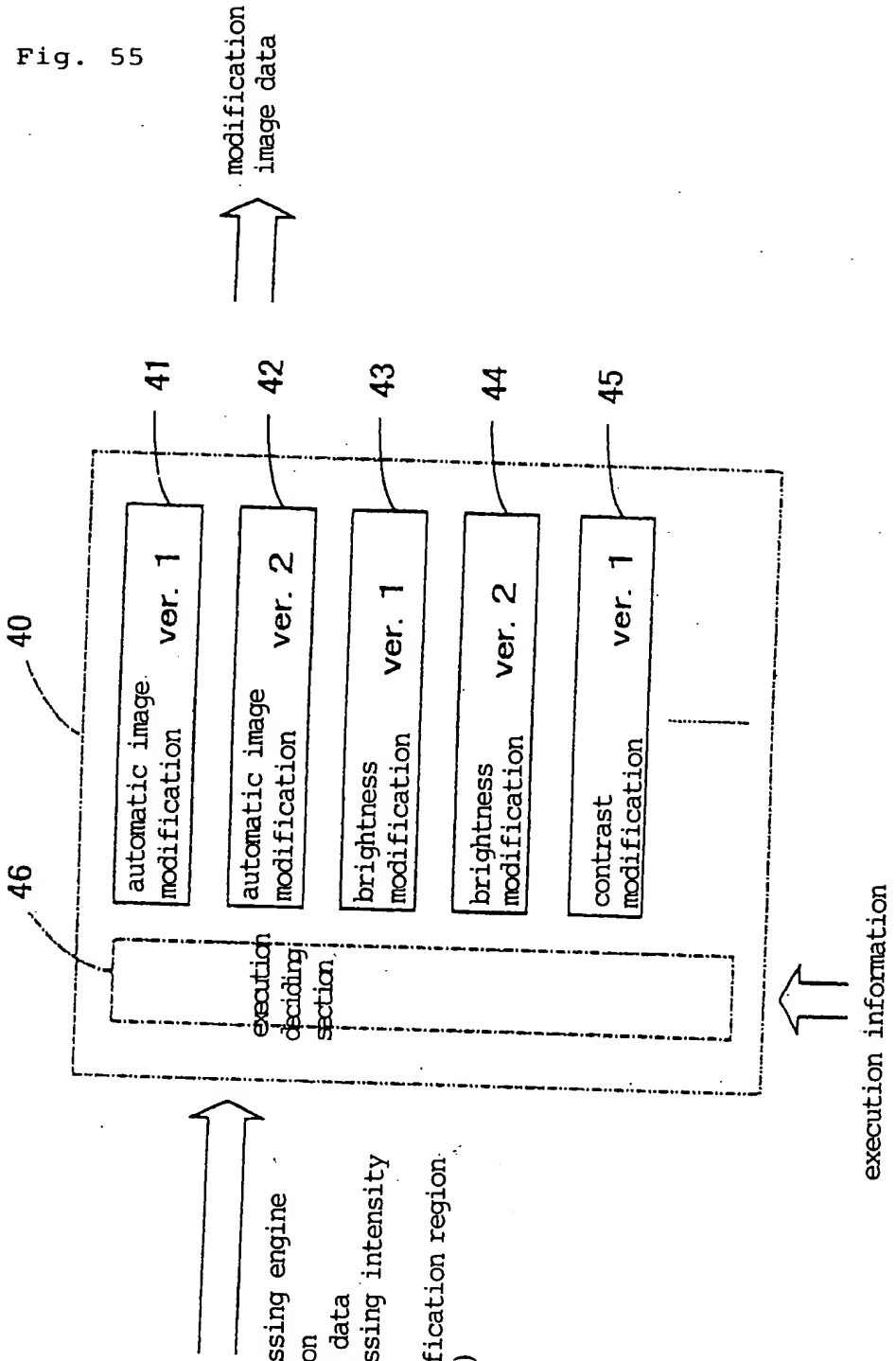
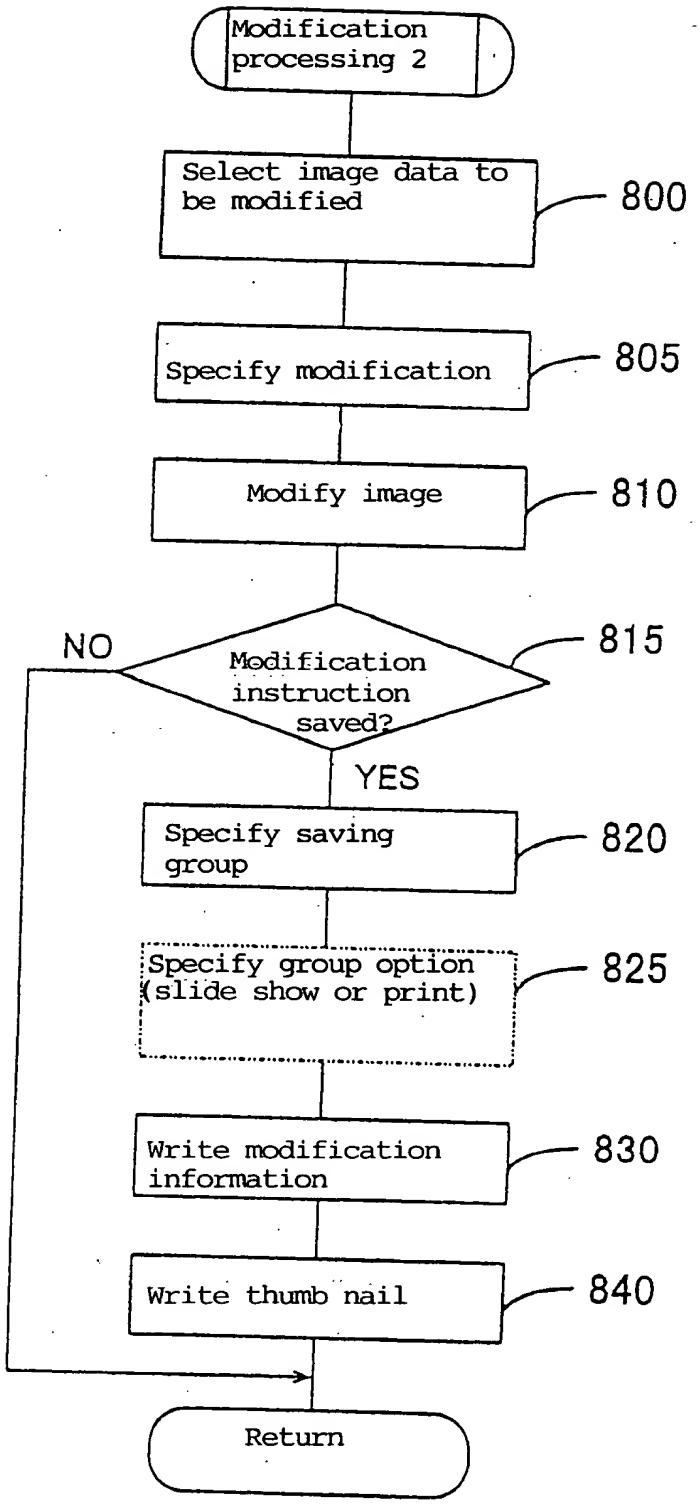

modification image data
41
42
43
44
45
40
automatic image modification ver. 1
automatic image modification ver. 2
brightness modification ver. 1
brightness modification ver. 2
contrast modification ver. 1
46
execution deciding section
processing engine version
image data processing intensity
(modification region layer)
execution information

Fig. 56

group	processing	engine	order	processing intensity
1	automatic image modification	V1	1	1
	brightness	V1	0	0
	contrast	V1	0	0
	red	V1	0	0
	green	V1	0	0
	blue	V1	0	0
2	automatic image modification	V1	0	0
	brightness	V1	1	2
	contrast	V1	1	1
	red	V1	0	0
	green	V1	0	0
	blue	V1	0	0

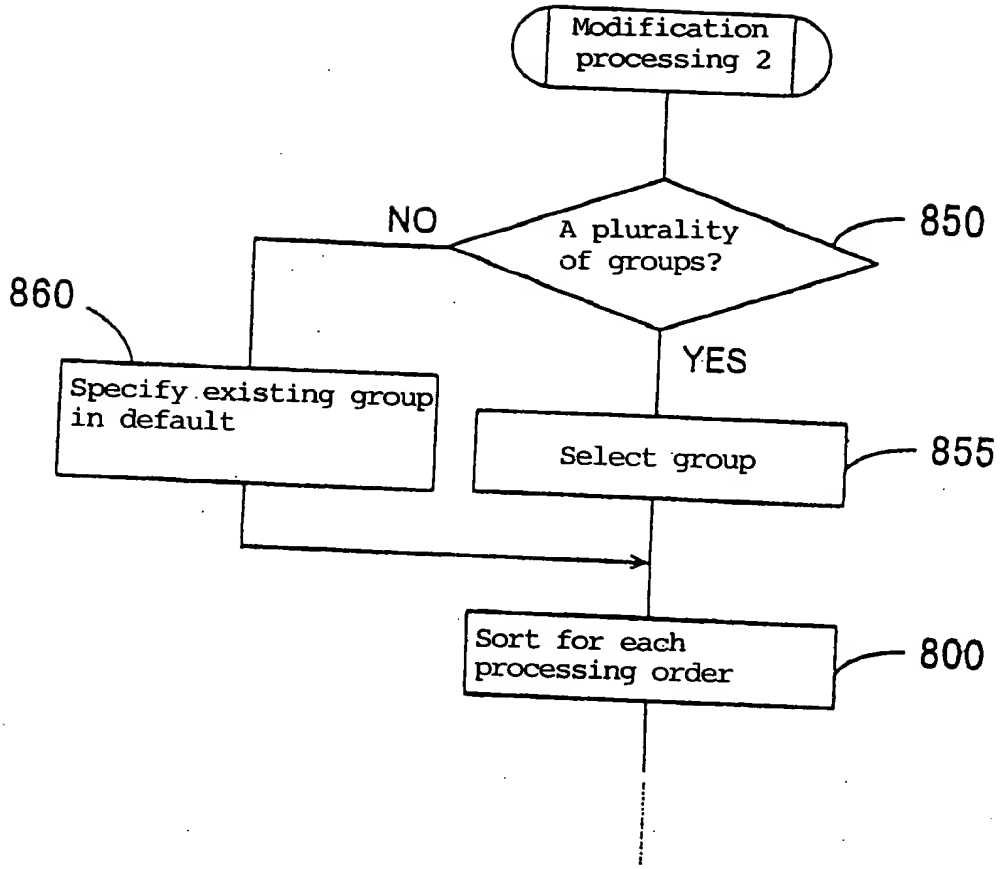
0004590 "5965360

Fig. 57



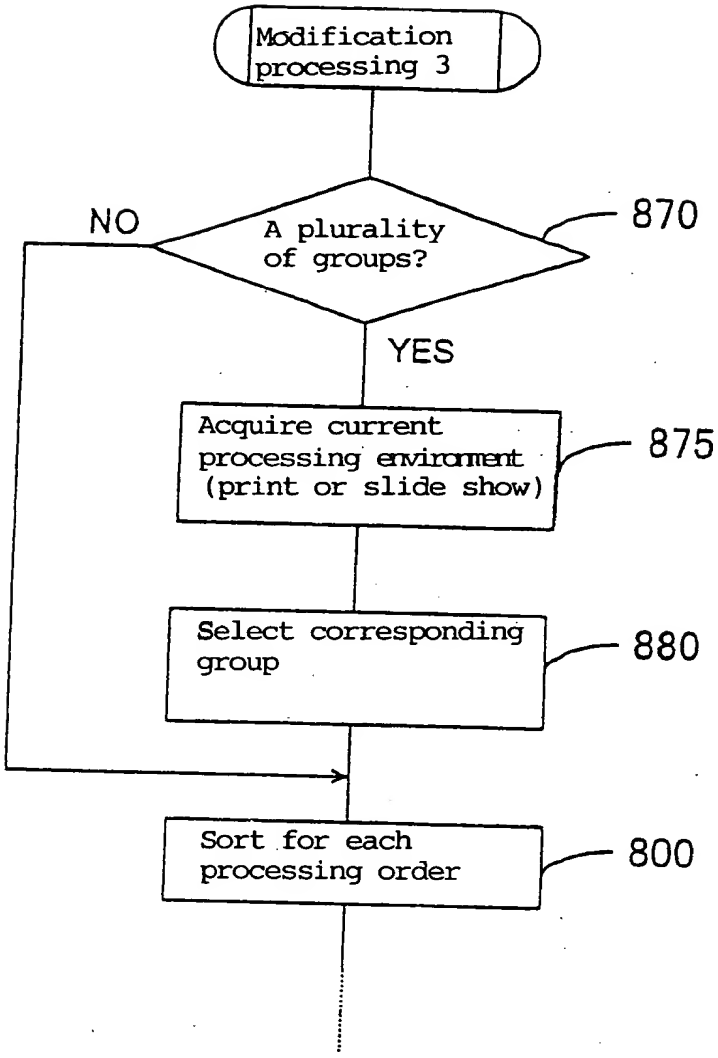
09529665.060300

Fig. 58



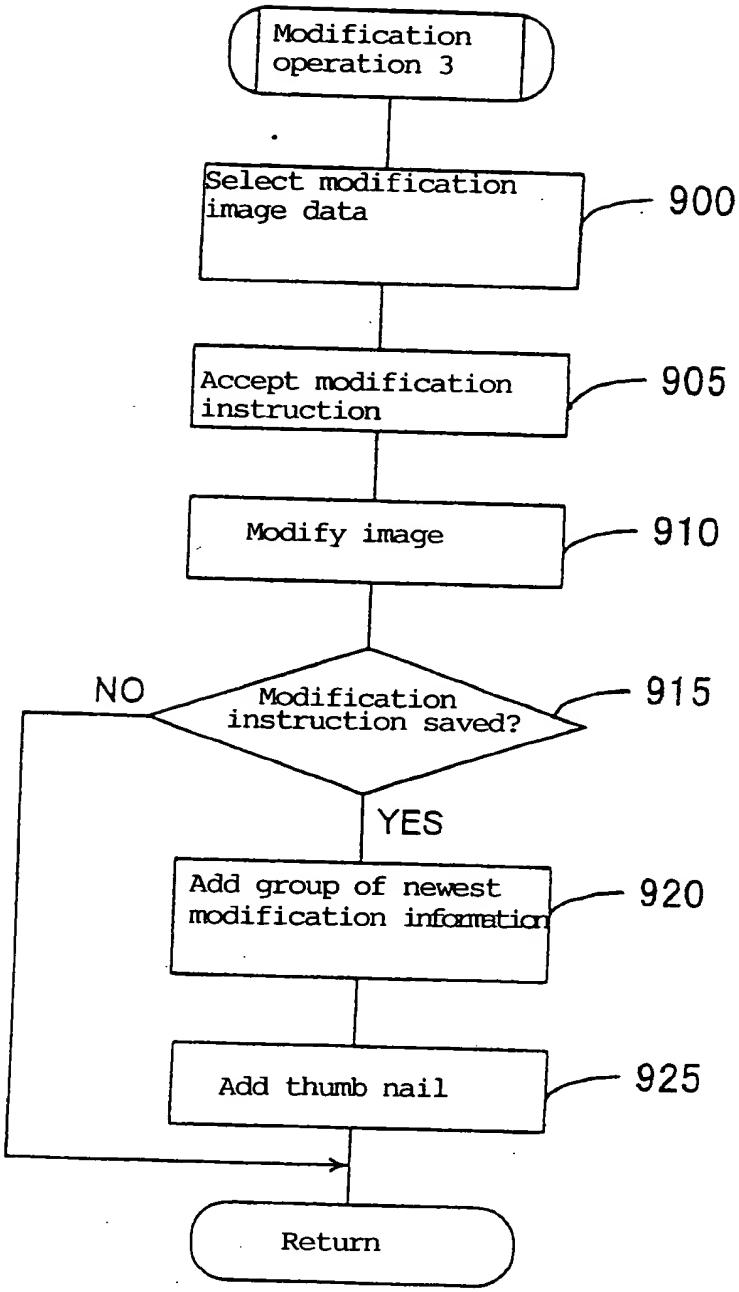
0529665.060800

Fig. 59



09529665.060300

Fig. 60



09529665 - 050900

Fig. 61

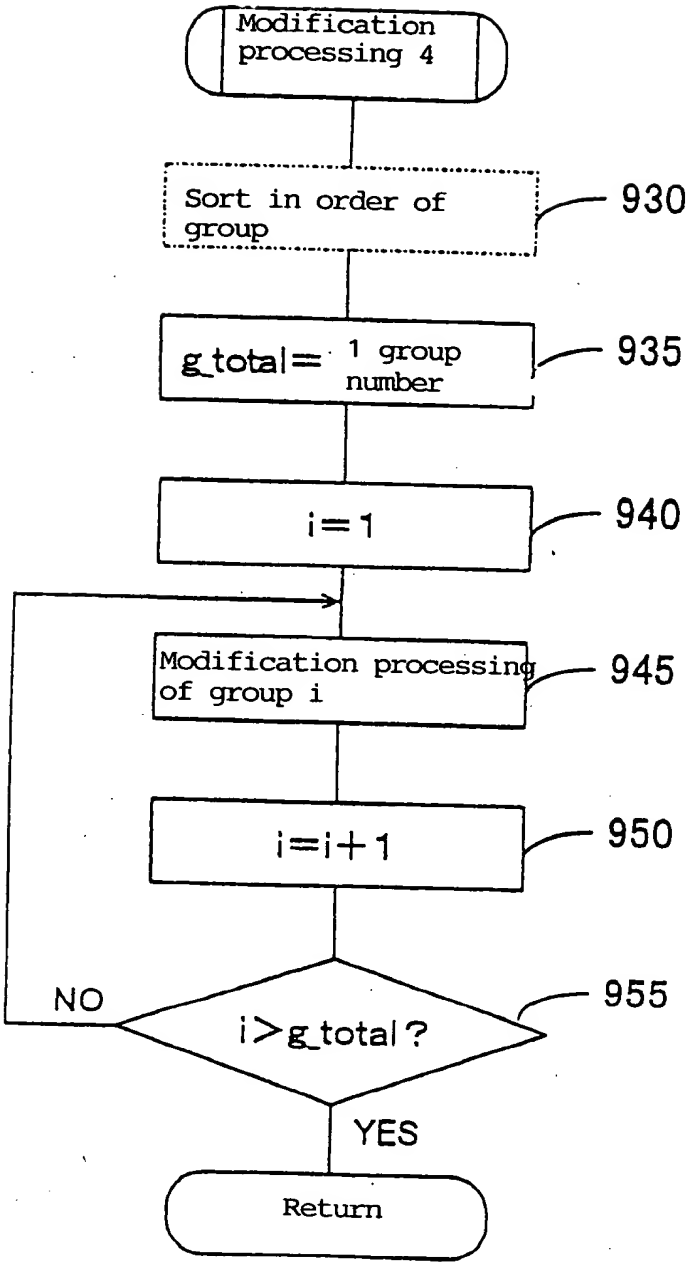
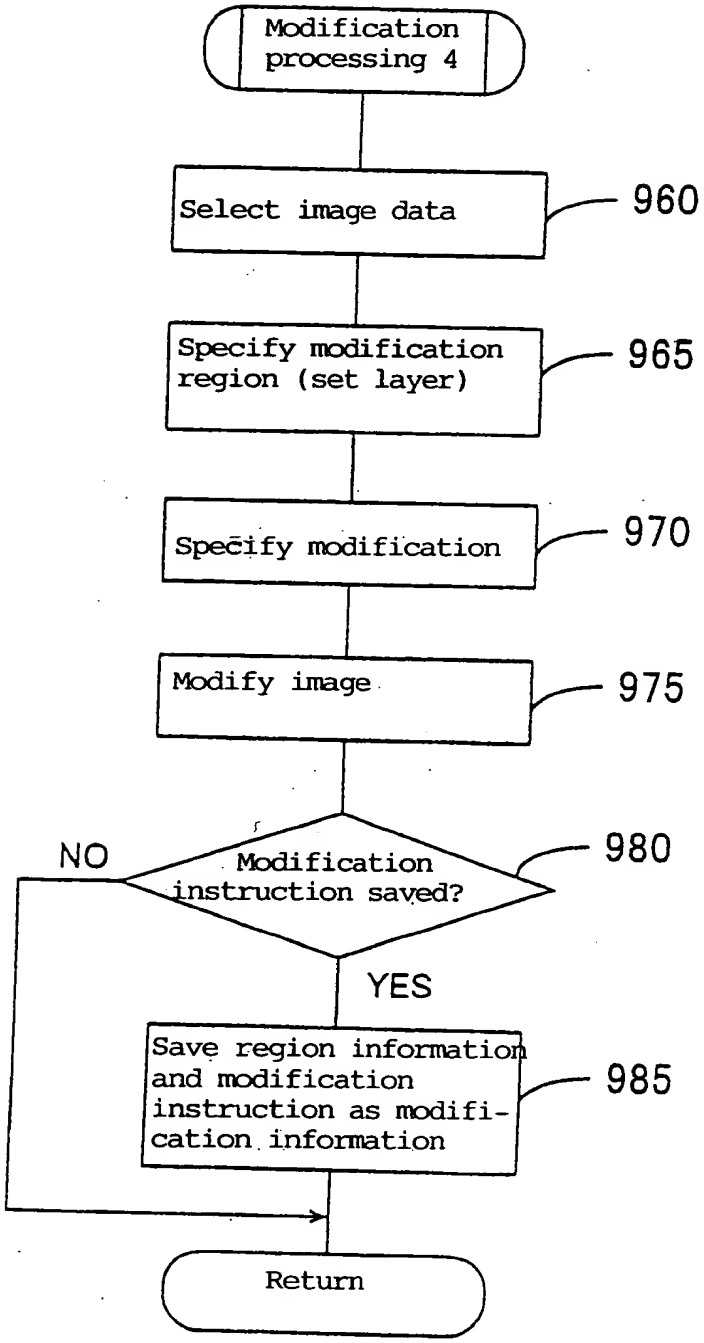

Modification processing 4
Sort in order of group
930
g_total= 1 group number
935
i=1
940
Modification processing of group i
945
i=i+1
950
NO
i>g_total?
955
YES
Return

Fig. 62


Modification processing 4
Select image data
960
Specify modification region (set layer)
965
Specify modification
970
Modify image
975
NO
Modification instruction saved?
980
YES
Save region information and modification instruction as modification information
985
Return